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INVESTIGATIONS OF OBSTETRICAL FACTORS IN SUBSEQUENT NEUROPSYCHIATRIC DISORDERS IN CHILDREN*

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OBSTETRICS as a medical science has moved from the knowledge in reduction of maternal mortality to the problems of mortality and morbidity of the fetus and newborn infant. Progress often involves questioning of older standards in order to solve new problems. The following entities have been found to be significantly associated with complications of pregnancy: cerebral palsy, mental deficiency, epilepsy, behavior disorders in children, reading disorders, tics in children, hearing disorders and blindness.[1, 2, 3, 8, 17, 19, 20, 26] In the short time at my disposal, I should like to review some of the efforts being made in investigations of the obstetrical factors in these conditions as they relate to the state of Rhode Island and the nation in general.

Many recent epidemiological investigations have postulated an association between perinatal complications, prematurity, and the development of neuropsychiatric disabilities. They have also postulated a continuum of reproductive casualty that ranges from sufficient brain damage to cause fetal and neonatal death to the lesser degrees of brain damage extending from cerebral palsy down to the minimal damage that may result in behavioral dysfunction.[19, 20, 26] Therefore modern research on the defects of the developing nervous system must have a broad biologic concept as follows:

1. *Epidemiological investigations.* Postulate association between perinatal complications and the later development of neuropsychiatric disabilities.

2. *A "continuum" of reproductive casualties.* Severe brain damage causing fetal and neonatal death.

Less severe causing cerebral palsy down to minimal damage resulting in behavioral dysfunction.

It is apparent that the design of future investigations must be intimately concerned not only with growth and development of the nervous system, but the whole embryo, fetus and neonate. Damage at any time during the intrauterine period may involve the nervous system, but the other tissues as well. The inter-relationships of central nervous system and the other body tissues must be preserved, if the concept of the "total or whole child" in any future mental or physical abnormality is to be properly evaluated.

In a previous review of the obstetrics environment in cerebral palsy, the author[1, 2] found that the factors were divided into three main groups, namely, prenatal, paranatal, and postnatal factors. The prenatal factors were summarized as follows:

Factors	*Percent of cases*
Primiparity	57%
Maternal trauma	5%
Maternal disease	6%
Nausea and vomiting	23%
Hypertension	14%
Anemia	12%
Toxemia	(5–10%)
Diabetes	0.8%
Vaginal hemorrhage	12%
Abruptio	4–15%
Placenta previa	3%
Prematurity	20–35%

As can be seen in the above tabulation, prematurity and hemorrhagic complications appear to be significant. The diseases known to cause prematurity are chronic hypertension, syphilis, abruptio, placenta previa, heart disease and eclampsia. However, these diseases accounted for only forty per cent of the total problem of prematurity. In sixty per cent, according to the data of Eastman,[10] no specific explanation for the premature onset of labor can be elicited. The paranatal factors involved in cerebral palsy were as follows:

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*From the Department of Obstetrics, Johns Hopkins University Medical School and Hospital. Presented at the 146th Annual Meeting of the Rhode Island Medical Society, at Providence, Rhode Island, May 1, 1957.

Factor	*Percent*
Forceps delivery	24%
Mid forceps	16%
High forceps	3–5%
Breech delivery	4–9%
Version and extraction	18%
Cesarean section	3–8%
Holding head back	10%
Precipitate delivery	5%
Pituitrin stimulation	13%

The above list would seem impressive, but again the same criticism of the prenatal factors and the lack of controls nullify most of the above data as significant. High forceps, version, and extraction, and holding the head back during the second stage of labor have been condemned procedures for many years by all teachers of obstetrics.

The postnatal factors that are listed in the literature would include the following:

Factor	*Percent of Cases*
Twins	5%
Sex	57% male
Kernicterus	4–6%
Neonatal jaundice	10%
Rh incompatibility	12%
Cyanosis	30–70%
Required oxygen	30%
Birth injury and asphyxia	38–53%
Convulsions	10–30%

Considerable difference of opinion exists as to the condition of the child at birth who will develop cerebral palsy in the future. Most studies in the past have been done in the retrospective fashion in which the birth histories of these children show a consistent high per cent of abnormalities such as cyanosis, jaundice, apnea, and convulsions. On the other hand, recent studies on the prognosis of children described as apneic or asphyxiated at birth have shown complete recovery. This presents the question of methods and types of studies which will have to be done in order to come up with new knowledge.

The scientific approach or methods contemplated may be listed as follows:

A. Epidemiological (clinical pathological correlations).
   1. Prospective studies.
   2. Retrospective studies.
      Examination of brains of infants and children in which detailed clinical histories are available.

B. Basic research on the developing nervous system.
   1. Virological.
   2. Endocrinologic.
   3. Chemical studies, oxygenation, nutrition, metabolism.
   4. Fetal physiology (Placental circulation, etc.).

C. Parallel animal experimental studies.

It is obvious that the only direct approach to this problem would be an extended longitudinal study beginning with a large group of pregnancies and newborns at birth carefully classified as to their responses to the birth processes; described as apneic, nonapneic, birth injuries, or asphyxiated, and followed for many years until they are evaluated as either normal or abnormal adults and in the event of death, careful autopsies on the central nervous system.

Perhaps it would be pertinent to look at the problem based on an estimate of human reproductive failure in the United States and Rhode Island.[3] In the following table we have estimated the potential reproductive wastage for the United States and Rhode Island.[25]

Immediate Problem	**United States (1950)**	**Rhode Island (1954)**
Deaths in first 28 days of life	72,855	332
Fetal deaths	68,262	262
Spontaneous abortions (10 percent of all pregnancies)	362,241	1,920
Criminal abortions (6 percent of all pregnancies)	217,344	1,168
Ectopic pregnancies	22,640	122
Aftermath or "Continuum"		
Cerebral palsy	21,369	114
Epilepsy	7,244	39
Mental retardation	18,110	91
Blindness	822	5
Deafness	5,000	27
Cleft palate and cleft lip	4,708	23
Congenital hip and heart disease	?	?
Facial asymmetry (Boder)	——	——
Total	800,595 (22.1%)	4,103 (21.4%)
Total births	3,622,411	19,204

I do not have time to discuss the above data in great detail, but much of it is based on application of present incidence data, some of which is not entirely accurate, but as accurate as it is possible to obtain at this time. In 1954, in Rhode Island, 19,204 fetuses and infants were born.[25] However, if our estimates are correct, 4,103 or 21.4% of all the infants and products of conception were not successful in the state of Rhode Island. This is an estimate of your problem in future years. The specific types of infant deaths in the first twenty-eight days in the state of Rhode Island in the year 1954 were as follows:

Congenital Malformation	47
Birth Injury	54
Asphyxia and Atelectasis	59
Immaturity (Prematurity)	111
Hemolytic Disease	14
Infection	8
Other Diseases	39
Total	332

Three hundred and thirty-two live-born infants died in the first twenty-eight days in the state of Rhode Island in 1954. As you see by the specific types of death, prematurity looms as one of the most significant causes of death. Since we have emphasized a hypothetical relationship between infant deaths and infant morbidity with such problems as neuropsychiatric sequelae, it is important to look at the next table which shows the problem of prematurity in the state of Rhode Island.

	United States	Rhode Island
Total live births	4,017,362	19,204
Premature live births	283,994 (7.0%)	1,188 (6.2%)
Premature deaths	74,644	237
Premature per cent of infant deaths	50.8%	71.4%

The premature demands special attention and does not always receive it in the average obstetrical clinic. Often the person with the least amount of training is allowed to deliver the premature, when he might not be allowed to handle a more complicated full-term delivery. In the previous literature on neuropsychiatric sequelae of the birth processes the premature is a factor in the following:

Type of Defect	Per Cent Born Prematurely
Cerebral Palsy	20% to 35%
Epilepsy	13.7%
Mental Deficiency	17.0%
Blindness	90.0%
Deafness	25% to 30%
Normal expected rate	7%

Certain obvious aspects of the conduct of premature labor and delivery are important to emphasize. Stimulation of labor should be avoided. If at all possible maintain the membranes intact until the time of delivery. Avoid the use of analgesics or general anesthesia for delivery. This is one of the situations where conduction anesthesia or local block anesthesia with an episiotomy is important. Because of the low blood volume of the premature infant, it is important to delay clamping the cord as long as possible. During this period, make sure the infant has a clear air way with gentle handling. If at all cyanotic, some oxygen of a lower percentage than 100 per cent should be administered.

No discussion of the premature would be complete without some mention of the factors in the cause of premature onset of labor. Here a great deal of time and thought have been placed on such general questions as nutrition, race, and economic status. It may well be that the underlying cause of prematurity is much more specific in nature. The author has been fascinated by the work of Csapo[7] and others who have shown that in a smooth muscle organ, such as the uterus, it is the cell and its metabolism which are the basic mechanisms involved in functional myometrial disorders.

These workers have been devising more accurate and direct means of probing the differences in the smooth muscle of the uterus in terms of molecular activity. A complex system consisting of actomyosin and adenosinetriphosphate are inter-related to endocrines such as estrogen and progesterone and modified by the biophysical action of potassium and sodium ions. This has prompted numerous clinical studies around the use of progesterone in the maintenance of an adequate nidation site as well as a quiescent uterine smooth muscle. Other clinical studies have suggested the prevention of premature onset of labor by administration of "Releasin" or "Lutrexin" to the patient.[13, 14, 23] These studies require more evidence than is available at the present time.

The subject of birth injury deserves special consideration. With refinements of the mechanical factors, such as the wiser selections of cases for pelvic delivery, dural tears and subdural hemorrhages are being reduced to a minimum. At the present time brain hemorrhages are divided into those generalized subdural hemorrhages which are due to the stress and strain of the birth act and the subarachnoid and ventricular hemorrhages interpreted at the present time as the result of intra-uterine anoxia.[15] No one questions that direct trauma can cause diffuse and focal damage to the infant's brain. There is great difficulty, however, in assessing the possible roles of traumatic or anoxic damage in any given child, as is perhaps best exemplified by the increasing number of papers bearing on this point.

One type of brain hemorrhage which has a debatable status because of its past history is the small petechial hemorrhage into the brain sub-

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stance itself. Schwartz described these lesions in detail in 1924.[28] He also emphasized that they were often located in the central white matter and basal ganglia of the forebrain. He concluded that very few infants failed to have some degree of petechial hemorrhage in their brains. Numerous other investigators have corroborated the presence of these capillary hemorrhages and for a period of time they were considered to be normal phenomena. However, premature infants are very likely to have hemorrhages in the brain without gross lacerations. The inadequate supporting tissues and increased fragility of their blood vessels may contribute to these hemorrhages. Recent studies on the brain in regard to the presence or absence of this type of hemorrhage are infrequently reported, but it is the impression of this author that intracerebral petechial hemorrhages are not as common as previously thought.

The affects of anoxia on the human newborn brain have been known and reported. Clifford[4] in his study on the effects of asphyxia on the newborn infant described cerebral edema in seven infants' brains and small areas of hemorrhage in three cases. One infant showed encephalomalacea and another cerebral ganglion cell degeneration. Courville[6] has been most convincing in his support of the idea that a number of chronic disease states which make their appearance during infancy and early childhood, have their genesis in neonatal "asphyxia." In this group of lesions are included cortical scars, atrophic lobar sclerosis (ulegyria), cerebral hemiatrophy, diffuse atrophy of the brain, chronic progressive degeneration of the cerebral gray matter, porencephaly, chronic infantile cystic degeneration of the cerebral white matter, the demyelinating diseases of infancy and childhood, and the striatal diseases, such as status marmoratus and status demyelinatus. Courville[6] feels that the inherent characteristics of the lesions themselves suggest their anoxial origin.

Most studies on fetal or newborn brains have been primarily concerned with gross hemorrhagic phenomena. Few studies have been conducted with information comparable to the studies in adults in the observations made by Haymaker and Lewis[18] on high altitude anoxia. Their findings showed hemorrhages in the cerebral cortex, subcortical white matter, and periventricular region, including the floor of the fourth ventricle. Edema, particularly perivascular sponginess, was a conspicuous feature. In recent years, more attention has been paid to the studies on circulation and blood supply to the brain of the newborn infant. Earle, Baldwin, and Penfield[9] have demonstrated an incisural sclerosis related to temporal lobe seizures which are in their opinion produced by hippocampal herniation at birth. They feel that the branches of the posterior cerebral, anterior choroidal and middle cerebral arteries, which cross the free edges of the tentorium to supply the mesial and inferior surfaces of the temporal lobe, are so placed that temporal herniation at the time of birth would compress these arteries against the free edge. These authors have also shown that compression of the heads of stillborn babies does produce temporal lobe herniation and that unless the head is frozen, the evidence of this herniation disappears, so that it might well be missed during routine necropsies. In the past, mainly due to the work of Schwartz,[28] most of the attention has been focused on the injuries to the venous structures of the cranial cavity. Schwartz has advocated that direct and indirect effect of the action of the most important driving force of the birth process is the lower pressure or "release principle." It is entirely possible that in future studies, more emphasis on the arterial blood supply will be made. In this regard the monographic works by Lindenberg[21, 22] on the circulation difficulties of the brain should be studied by all students of the newborn brain problem.

Time does not permit us to go into the vast subject of the congenital malformations of the brain. As is well known, most of the malformations which produce death of the fetus and newborn are primarily in the central nervous system. This vast subject of malformation of the brain has only been touched upon by a few workers in the field. In addition to these developments amazing strides in the field of experimental embryology have pushed this type of investigation into an interesting adventure at this time.

The investigations of the problems of kernicterus and the sequelae due to this interesting phenomena would comprise the substance for an entire lecture, but I want only to mention that investigations in this particular disease are well on their way and are offering some of the most promising leads at the present time.

The state of Rhode Island and its major city, Providence, lends itself to this type of epidemiological investigation. The definition, distribution, and dynamic behavior of a disease can be studied in a smaller human population area. As stated previously, there are two methods of approach, retrospective and prospective. In the former, children with neuropsychiatric sequelae are investigated and the birth certificate or hospital record are probed for information. The difficulties of this type are obvious. Incompleteness of observations and records do not answer the pertinent questions. In the prospective approach, a "profile" or prolonged follow-up of a series of carefully investigated pregnancies, labors and examinations of children over many years is made. This type of approach has greater reliability of its data. However, it must be remembered that the yield of neuropsychiatric sequelae may only be 15-20 per 1000 pregnancies

studied. As most of you know, from information in your newspapers, Brown University is to begin such an investigation into the causes of cerebral palsy and mental retardation. Mothers, infants, and children will be studied over a period of several years. The data will be collected by various medical institutions in the state and will include complete family history, pregnancy and prenatal histories, a detailed account of events at birth, a complete physical and psychological history of each child during its initial stay at the hospital. Infants who show signs of stress, or defects in development, or neurological problems will be selected for follow-up and will receive periodic psychological and neurological examinations. Several clinical disciplines including obstetrics, pediatrics, orthopedics, endocrinology, otology, ophthalmology, and neurology will work with the basic laboratory disciplines such as biology, psychology and biochemistry to unlock the complex nature and ramifications of the developing embryonic, fetal and early neonatal nervous systems.

One of the most important phases of these investigations is the basic science correlations in the profile of the human pregnancy. Although the general clinical pathological correlations tend to confine the participants to numerous tedious routine tasks, it is in the basic science program that considerable freedom for individuality exists. It is hoped that with the proper interest of chemists, physicists and biologists, the chances of having new information from empiric chance by bench workers, will in the long run be the most productive aspect of these programs. The biologic variations and mechanisms in the growing fetus and its central nervous system should offer a fertile field for this type of basic research. A relationship of chemistry, oxygen, electrolyte balance, the endocrines, and the relationship of viruses to the nervous system are just a few of the subjects that should be of interest to the basic scientist. The ability of the fetus to live and grow in its environment, in spite of numerous difficulties is a subject of considerable interest. Eastman[11] in his essay on *Mount Everest in Utero* has illustrated how the fetus adapts to an oxygen environment comparable to an adult human being at approximately an altitude of 33,000 feet. This is accomplished by a series of chemical changes involving hemoglobin.[12] At the present time the critical oxygen values on both sides of the placental barrier are known,[5, 27] and in general it is felt that at forty weeks, the fetal blood is about sixty per cent saturated with oxygen.[29] The fetus is able to stand such an oxygen deficit because of a certain amount of acclimatization, and a number of mechanisms for obtaining energy without the use of oxygen.[16] The mother's blood is so adjusted that maternal hemoglobin gives up oxygen more readily than the nonpregnant adult and the fetal blood is so adjusted that its hemoglobin takes up oxygen more rapidly than that of the adult.[5] Since the rate of fetal uptake of oxygen is high and the uterine blood flow is increased in pregnancy, the fetus uses a higher proportion of the oxygen available to it than does its mother. The fetus, therefore, lies in a very complex chemical environment in which a certain number of nutritional elements must be integrated by a series of complex mechanisms into proper growth and development. Knowledge for such investigations, therefore, must come from most of the known basic science specialties. It is obvious that no one will be able to have all the necessary scientific disciplines in one place, but it is hoped that, in each project, there will be great emphasis on this basic science correlation with the clinical investigation. The creation of complex teams consisting of clinically-minded and laboratory-minded people is always a complicated organizational procedure. The factors of human motivation, morale, communication, management of personalities, and numerous tedious tasks that must be performed, often determine the success or failure of such a plan. In the past, longitudinal studies of this type have been done. A good example is that of the Sloane Fetal Life Study.[24] However, many of these have not been successful.

Certain problems on the effect of pregnancy influences on the fetal and neonatal brain will be studied by a series of parallel animal experiments. The monkey offers many advantages for obtaining data which would be impossible in the human pregnancy. It is hoped that several primate experimental physiology and pathology laboratories will be initiated into the plan.

Finally, it should be concluded that this type of investigation depends largely on the community health service aspects of the social groups it involves. Public opinion, education and information, and the basic ethical, moral, and selfless leadership

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CLINICAL INSTINCT

The valuable property of "clinical instinct" which, although sometimes ridiculed as the assumed armour and decoration of the ignoramus or the quack, has a certain resemblance to the poetic faculty, and moreover is a real asset in practice. Clinical instinct is the power of arriving without a conscious logical process at a definite conclusion, and is often possessed in a high degree by old nurses who know those who will recover or die, and by practitioners of long experience who similarly cannot explain the steps by which they reach a diagnosis and prognosis. It may be assumed that they unwittingly draw on a buried experience which, without their conscious remembrance, recognizes in the patient signs presented by one in the long past. In diagnosis, therefore, there are the two processes, the consciously logical and the rarer, but not necessarily less correct, unconscious.

SIR HUMPHREY ROLLESTON (1862-1944)

of the medical profession of your state are important ingredients in the success of these investigations. It is hoped that this type of effort, in a national collaborative manner, will lead to the analysis and linkage of a specific insult in the obstetric or perinatal period, to a specific lesion in the developing brain, which may be related to subsequent specific neuropsychiatric sequelae.

SUMMARY AND CONCLUSIONS

A report on current investigations of the obstetrical factors in subsequent neuropsychiatric disorders in children has been presented. The objectives of these studies are to discover and evaluate the genetic and environmental factors in the etiology of these conditions by means of collaborative field investigations, as well as special basic science studies. These investigations will attempt to correlate the clinical findings in neuropsychiatric sequelae and other brain damaged patients with subsequent pathologic findings obtained by autopsy. A multidisciplinary attack on this relatively large, but uncharted field of neurological and sensory disorders, will involve several clinical disciplines, including obstetrics, pediatrics, orthopedics, endocrinology, otology, ophthalmology, and neurology. These investigators will work with the basic laboratory disciplines including biochemists, psychologists, and other workers in experimental medicine, to try to unlock the complex nature and ramifications of the developing, embryonic, fetal and early neonatal nervous systems.

The studies fall into four main groups, retrospective, prospective, basic science correlative studies, and the experimental animal studies. Young obstetricians, pediatricians, neurologists and pathologists should be encouraged and supported in the study of fetal and newborn physiology and pathology.

A team approach is therefore necessary, in which coordination between medical and laboratory disciplines, voluntary health agencies, community groups, national agencies, and the Rhode Island State Medical Society are needed to operate such a plan successfully. It is hoped that such complex longitudinal life cycle studies will eventually show how a specific insult in the obstetric or perinatal period relates to a specific lesion in the developing brain which may be related to subsequent neuropsychiatric sequelae.

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RECENT ADVANCES IN THE UNDERSTANDING AND MANAGEMENT OF CEREBRAL VASCULAR DISEASE*

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ONE OF THE most encouraging developments in the fields of neurological medicine and surgery in the past decade has been the awakened interest in the manifold problems presented by cerebral vascular diseases. These are of importance for the following reasons: a) *as a cause of death* (next only to heart and malignant disease); b) *as a cause of prolonged disability* (an estimated two million individuals are directly affected in the U.S.A.); and c) *as a scientific challenge* in our aging population.

No attempt will be made here to review this subject comprehensively. Rather, we shall try to outline recent researches in the "functional anatomy" and pathology of the cerebral circulation and call attention to two uncommon and two very common types of cerebral vascular disease, emphasizing diagnosis and treatment.

Special Features of the Cerebral Circulation

In addition to lacking a lymphatic system, the cerebral circulation has a number of other unusual or unique features which may be summarized as follows:

a) critical dependence of the brain on a continuous supply of oxygen and glucose;

b) although making up only 2% of body-weight, the brain requires and receives (with remarkable regularity under various stresses) about a sixth of the cardiac output;

c) for the most part, the larger vessels lie relatively exposed in the subarachnoid space at the base of the brain or in the large fissures with many peculiar bends and twists, perhaps enhancing a tendency to aneurysmal formation or rupture;

d) lack of effective collateral circulation for terminal arteriolar vessels in the brain stem and basal ganglia; e.g. the circle of Willis is only a *potential*, not an actual anastomotic channel;

e) unique histologic structure (poor media, thin internal elastica, no external elastica) which is poorly equipped for vasoconstriction normally, but capable of moderate vasodilatation by an increase in pCO_2 or decrease in pH or pO_2.

This list could easily be extended, but, when translated into practical items, it means that the brain has an *extraordinary sensitivity to anoxia.* Thus, the neurons of the cerebral cortex begin to "die" after 20 seconds of complete anoxia[1] and it is well-known that, at normal body temperature only 3½ to 4 minutes of complete cardiac arrest produces irreversible mental and neurologic dissolution.

It further implies that cerebral circulation cannot be altered effectively by stellate ganglion block or by most of the drugs which act as systemic vasodilators. The most important factors in maintaining and regulating the cerebral circulation have been found[2, 3, 4] to be: (1) systolic or mean arterial blood pressure; (2) mean venous pressure; (3) available oxygen in blood; (4) local metabolic demands; (5) collateral circulation, and (6) local cerebral vascular resistance.

The latter depends on blood viscosity (hematocrit), intracranial pressure, and humoral factors noted above which regulate the "tone" of the cerebral vessels (pH, pO_2, pCO_2). Thus, paradoxically, inhaling 100% oxygen reduces cerebral blood flow (13%) by causing vasoconstriction while inhaling 7.5% carbon dioxide — 92% oxygen increases cerebral blood flow by 75%.

On critical analysis, the frequently invoked "spasm" of major cerebral vessels has little to recommend it. Positive evidence for its occurrence is remarkably difficult to find. As we shall see below, there are other more reasonable explanations for transient episodes of cerebral dysfunction. It would appear that neurogenic vasoconstrictor influences on the cerebral circulation are, for some unknown reason, quite feeble in comparison with their importance in the systemic circulation.

Pathology of Cerebrovascular Disease

Traditionally, the pathology of cerebrovascular

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*Presented at the meeting of the Providence Medical Association, at the Rhode Island Medical Society Library, April 1, 1957.

disease includes the *Big Four* of cerebral thrombosis, cerebral hemorrhage, cerebral embolism, and saccular (congenital or "berry") aneurysm. From this point of view, all or most cerebral vascular disease is the result of one of three processes: ischemic or hemorrhagic infarction, massive hemorrhage into the parenchyma of the brain, or subarachnoid hemorrhage.

The relative frequency of each in two carefully conducted studies is given as follows:

TABLE I

Condition	Post-Mortem Study BCH[5]	Post-Mortem Study NINY[6]	Clinical Study NINY
Thrombosis	41%	43%	66%
Hemorrhage	20%	47%	21%
Embolism	33%*	10%	5%
Subarachnoid Hemorrhage	6%	.....	8%

*Proved and probable

Actually, this grouping does not include many other important types of cerebral vascular pathology, e.g., vascular malformations, the various arteritides, venous thrombosis, the vascular lesions associated with trauma and blood dyscrasias, "hypertensive encephalopathy," etc. The major objection to this classification, however, is that recent studies have seriously questioned the status of the previously well-established entity of "cerebral thrombosis," commonly thought to be the most frequent type of cerebrovascular disease.

While cerebral atherosclerosis, similar to the same process elsewhere, is still considered the basic pathologic process behind areas of brain-softening, we have come to realize that the dynamics of its development, the sites of predilection, and especially extracerebral factors are all important in determining its effect on the brain. Thus, it is peculiarly focal in the brain tending to occur at bends or bifurcations (e.g., carotid sinus, carotid siphon, middle cerebral artery in the Sylvian fissure, anterior cerebral artery at the genu of the corpus callosum, basilar-vertebral circuit). Because even the most intense degree of atheromatosis may result in no obvious dysfunction, while in other instances little or no plaque-formation may be associated with gross morphologic change, the concept of "cerebrovascular insufficiency"[7] has proved a useful one. This is usually the result of a "hemodynamic crisis" (Denny-Brown)[8] resulting in failure of the cerebral collateral circulation. While potentially reversible, it often implies a critical, borderline "pre-infarction" state upon which secondary thrombosis is prone to occur. Because of the difficulty in dating precisely the age of cerebral thrombi, the final proof of this hypothesis is still missing.

Polarographic studies in the experimental animal by my colleagues at the Boston City Hospital (Meyer et al[1]) have emphasized the vital roles of a maintained systemic blood pressure and arterial oxygen saturation in relieving this situation. Time is of the essence; the sooner corrective measures are instituted, the more easily reversible the process.

These studies have also served to call attention to the importance of "extracerebral" events in determining when a given cerebral infarction will occur. Cardiac pathology of many varied types resulting in reduction of oxygenation or cardiac output, the rash use of ganglionic-blocking agents in patients with "pipe-stem" cerebral vessels, or sudden vascular catastrophes resulting from spinal anesthesia, lumbodorsal splanchnicectomy, pheochromocytoma, or ruptured or bleeding peptic ulcers have all been seen as precipitating factors in our experience. Little is known of the adaptive mechanisms which tend to minimize such events in the normal individual, although the sino-aortic presso-receptors are involved.

Finally, we should refer briefly to the deleterious effect of maintained hypertension on the cerebral circulation. Pathologically, this may bring about several striking changes in the type, location and severity of cerebral occlusive vascular disease as well as enhancing the tendency to diffuse encephalopathy, focal intracerebral hemorrhage, aneurysmal dilatation and rupture. Every layman is aware that hypertension markedly enhances the likelihood of "strokes." There is astonishingly little medical information about the hypertensive patient before this catastrophe occurs. One recent study by Leishman[9] in a group of 234 patients, none of whom received effective medical or surgery therapy, emphasizes the impossibility of accurate prediction in any given case. However, a maintained diastolic pressure over 150 mm. Hg., progressive albuminuria and azotemia—implying severe renal disease of the type called "fibrinoid necrosis"—are ominous signs.

Following this brief review of the dynamics and pathophysiology of the cerebral circulation, we may now proceed to clinical considerations with four representative problems.

Case I

Anoxic Encephalopathy following Major Surgery

A 60-year-old caterer was admitted on 1/24/57 complaining of right abdominal pain of twenty-four hours duration which radiated to the right leg, the right shoulder, and right costovertebral angle.

Physical Examination: B.P. (pre-op.) 130/70. Diffuse abdominal tenderness, ? right upper quadrant mass. Neurological examination "normal."

Studies: I-V and retrograde pyelograms showed a large mass near the right kidney.

Hospital Course: Patient underwent exploratory laparotomy on 1/25/57 and a large right perirenal hematoma was found. The bleeding point was never located so the right kidney was removed. Despite 6 units of blood, the blood presure dropped to 80/60 for a period of ten minutes. The patient never regained consciousness and died in shock on 2/3/57.

Post-mortem Findings: 1. "Spontaneous" right perirenal hematoma (normal right kidney). 2. Acute tubular necrosis, left kidney. 3. Medionecrosis of the aorta.

There was mild, diffuse brain-swelling without pressure cones. The microscopic findings (spotty, diffuse chromatolysis of cortical neurons) were consistent with anoxic encephalopathy.

Comment

This is a dramatic example of the rare but irreversible central nervous system concomitants of major surgery when accompanied by shock in older individuals. It is difficult to see how this could have been prevented.

Of much greater statistical importance are less dramatic, but nevertheless disabling organic brain changes following general anesthesia in elderly patients. Bedford[10] has recently summarized his experience at the Oxford Geriatic Unit where he found that *10% of patients over 65 who had undergone operations under general anesthesia developed varying degrees of dementia.* His suggestions for avoiding these catastrophes should be read in the original by every surgeon who deals with this group of patients.

Case II

Cerebral Vascular Malformation, Unruptured Congenital Aneurysm, Telangiectasia of the Pons[11]

This fifty-five-year-old man was admitted on 1/26/53 after "collapsing" at work. There was a history of non-focal convulsions 16 and two years prior to admission. Severe recurrent headaches and a progressive personality change had developed over a six-months' period.

Neurological Examination: B.P. 142/100. No evidence of facial nevus or cutaneous telangiectasia. The findings were consistent with a right hemisphere lesion.

Spinal Fluid: normal pressure, bloody fluid with a total protein of 270 milligrams per cent.

Hospital Course: the patient had one "rotatory" (spinning) and several generalized seizures and died on the twelfth hospital day.

Post-Mortem Findings: (Figure I) A large, hemorrhagic wedge-shaped vascular malformation was found straddling the right Sylvian fissure. This was both superficial and subcortical, the narrow peak of the wedge "pointing" to the superior lateral margin of the lateral ventricle.

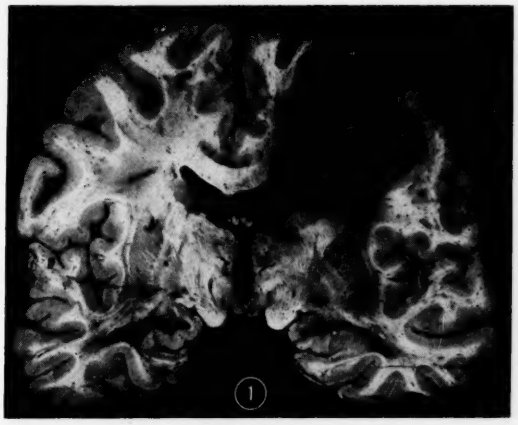

FIGURE I

Coronal section of brain showing large, wedge-shaped vascular malformation with rupture into lateral ventricle (reproduced by permission, *Neurology* 4:879 [Nov.] 1954).

In addition, an unruptured saccular aneurysm was found on the anterior communicating artery and a collection of telangiectatic vessels were discovered on sectioning the pons.

Comment

These lesions are not true vascular tumors ("angiomas") as originally described by Bailey and Cushing in 1938. They are vascular malformations (which can occur alone or as part of the Osler-Weber-Rendu or Sturge-Weber syndromes) which vary in size from a few millimeters to huge tangles of thin-walled vessels which seem to occupy much of a hemisphere. They are found also in the posterior fossa (Logue[12]) where they may produce brain-stem or cerebellar syndromes simulating tumor, multiple sclerosis or infarction.

The cerebral variety[13] is an uncommon cause of subarachnoid hemorrhage, but should be thought of in young individuals with "vascular" headaches, focal seizures, hemianopia or aphasia even when a bruit is not heard.

Aggressive neurosurgery under controlled hypotension by McKissock,[14] Olivecrona[15] and others is the best way to deal with these lesions when they are located in a favorable area for resection.

Case III

Post-Partum Cerebral Venous Thrombosis

A twenty-six-year-old woman (para III, grav III) was delivered of a normal infant on 4/1/57. Her immediate post-partum course was complicated by painful swelling and tenderness of the left calf. She was started on anticoagulants, the phlebitis became quiescent, and the anticoagulants were stopped on 4/4/57.

From 4/5 to 4/15/57, she developed the following:

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1. severe, throbbing left temporal headaches;
2. Jacksonian (focal) motor seizures affecting the right side;
3. right temporal headaches;
4. left-sided focal motor seizures;
5. total paralysis of the right side;
6. papilledema (moderate).

She never lost consciousness and did not develop hemianopia, hemisensory defect or hypertension.

Spinal Fluid: increased pressure, xanthochromia, 30 WBC/mm^3, 780 RBC/mm^3, mostly crenated; protein 110 mgm. per cent; sugar normal; smear, culture negative.

Course: the patient responded well to anticonvulsant therapy with intravenous dilantin and intramuscular phenobarbital. Anticoagulants were withheld at first, but with clearing of the cerebrospinal fluid, I-V heparin was started and continued for five days. She was discharged in four weeks on dilantin and dicumarol. A remarkable degree of recovery of her right side had occurred and the papilledema and seizures disappeared.

Comment

This entity, erroneously called "post-partum eclampsia," seems to be more familiar to internists and neurologists than to obstetricians. It characteristically involves the superficial cerebral (Rolandic) veins and may—as it did here—extend to the longitudinal sinus. Recovery, when it occurs, is more complete than after the usual "stroke" since the pathology is due to *venous* infarction.

Sinclair[16] reported on eighteen cases of "puerperal aphasia" over fifty years ago. Stevens[17] has recently added eight cases of puerperal hemiplegia due to this process to the literature, all of which recovered to varying degrees in from three weeks to a year without anticoagulants. .

Case IV

Carotid Stenosis Syndrome

This fifty-four-year-old laborer was seen for the first time on 3/11/57 complaining of weakness and numbness of the left arm and leg of six years duration without other neurological symptoms.

Neurological Examination: B.P. 136/84 (RA); 128/86 (LA). The right internal carotid pulsation was reduced. With the patient reclining, carotid compression on the right for ten seconds causes brief unconsciousness with prompt recovery upon releasing pressure. The same thing happened with left-sided compression without change in pulse or B.P.

The rest of the examination was normal except for reduced two-point discrimination, especially in the left hand. The patient declined to permit arteriography.

Impression: Probable right carotid stenosis with bilateral insufficient collateral circulation.

Comment

Although this clinical entity was known over forty years ago, it is only in the last two decades, with the development of arteriography by Egas Moniz in 1937, that it has become firmly established as an important and frequent type of cerebral vascular disease. In 1951, Johnson and Walker[18] were able to review over 100 reported cases. This study emphasized the fact that several clinical syndromes may be the result of stenosis or occlusion of the (cervical or cranial) internal carotid artery. These are the following:

1. blindness with optic atrophy and contralateral hemiparesis;
2. repeated episodes of transient unilateral weakness, numbness or both;
3. progressive dementia, headache, convulsions simulating brain tumor.

Accurate diagnosis depends on a high degree of suspicion, recognition of the frequency of this syndrome, palpation and cautious compression of the cervical portion of the involved and contralateral carotid (never more than 30 seconds), auscultation for cervical bruits, the use of an ophthalmodynamometer,[19] tilt-table electro-encephalography,[20] and, of course, carotid arteriography.

At the Boston City and Massachusetts Memorial Hospitals, my colleagues and I[21] have treated about fifty of these patients in the past two years, five by surgical correction of the arterial obstruction. Without treatment about 15% improved spontaneously, the remainder became worse, and 1:3 died during the period of observation. Of those treated, either medically or surgically, approximately 75% were considered to have improved appreciably. Each patient must be carefully studied by the techniques mentioned above before surgery is decided upon, but we feel that with more prompt recognition, the use of hypotension and hypothermia, and improved surgical techniques (e.g., Edwards-Tapp nylon shunt between the subclavian and internal carotid arteries *above* the obstruction), more of these patients could be operated on with benefit.

Long-term anticoagulant therapy[22,23] is also under study for this group. Preliminary impressions are that, properly supervised, these drugs are of definite help in preventing repeated episodes of ischemic infarction although the mechanism of their action is far from clear.

SUMMARY

This has been an attempt at a selective account of several aspects of cerebral vascular diseases not commonly emphasized despite their significance. Many important topics ("hypertensive encephalopathy," subarachnoid hemorrhage from ruptured aneurysms, temporal arteritis, rehabilitation techniques, dietary and hormonal approaches to the

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RED BLOOD CELL DISORDERS*

JANE DESFORGES, M.D.

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IN DISCUSSING some problems in anemia we will approach them from a study of iron metabolism and iron turnover to determine the mechanisms of production of the anemias in the patients presented.

To study internal iron metabolism, we must first review briefly together the normal pathways of iron metabolism.

Iron is introduced into the gastrointestinal tract organically bound in food as a ferric complex. Before being absorbed, it must be in a reduced form. When we administer it as medicinal iron, of course, we administer it as a reduced ion, as ferrous sulfate.

To get across the cell membrane, it is in this reduced form. Once in the cell, which in this case is a duodenal mucosal cell, it may be oxidized and stored in the form of ferritin, and eventually is passed on, and out the other side, probably again in reduced form.

In the circulating blood it is immediately bound to a plasma iron binding protein. If the capacity of protein is suddenly exceeded by an overdose the serious symptoms of iron intoxication appear, due to the presence of free ionic iron in the circulation.

The pool in which we are interested now is the transport iron. This iron in the plasma goes to different areas in various disease states. Normally, most of the iron, 80 to 100 per cent of all the iron entering the plasma, goes into the bone marrow and returns to the circulating blood in red cells in the form of hemoglobin. This is a closed cycle, barring hemorrhage. No iron is lost; it recirculates from plasma to hemoglobin to plasma. There are other minor, but important pathways through which iron also circulates in tissues.

A very minute amount is excreted, and I think for all practical purposes, it is of medical importance to consider this as negligible. In other words, if we see iron deficiency anemia in an adult, we must assume that the patient has lost blood. He never loses enough by excretion to become anemic.

What is left over after the bone marrow has been satisfied goes into storage areas in the liver and r-e system. In the storage area, the iron goes from the plasma protein into the liver cell and is stored as ferritin. As more and more iron is deposited, hemosiderin is also formed.

Iron storage gradually increases during life. Day after day, most of the iron is being used by the marrow, but there is a little bit extra that is gradually building up, mainly in the liver, as a storage depot. In the first year of life, then, we may at times see iron deficiency anemia, due to nutritional causes, because there is no extra storage. However, as time goes on, more is being absorbed, thus allowing more leeway for increased demands. Therefore, again, we should emphasize that in the adult, when we find evidence of iron deficiency, we must assume that iron has been excreted and in the human it is only excreted in the form of hemoglobin, and therefore, as hemorrhage.

We have been interested in studying mechanisms in various anemias, using radioactive iron as a tracer. By this means we have been able to evaluate and localize the iron pathways and depots in the pathogenesis of these syndromes. One does this by tagging the iron binding protein with radioactive iron and putting it in plasma. Then, by following the radioactivity, one can observe the rate of disappearance from plasma and the reappearance in the red cells.

In the meantime, by placing the radioactivity monitors over organs, one may observe sites of iron deposition, red cell production and red cell destruction. Normally, the peak of activity over the marrow is on the second and third days, and then this activity gradually disappears as radioactivity appears in the circulating red cells. The normal values for the rate of disappearance, for the rate of uptake and release from the bone marrow, and for the amount incorporated may be compared to those in various states.

Patients with aplastic anemia do not make blood; since the bone marrow isn't drawing it from the plasma, the disappearance of the radioactive iron is slow. On the other hand, in patients with polycythemia, the bone marrow is hyperactive, more red cells are being made and the blood iron disappearance is rapid. In patients with iron deficiency, the bone marrow is very avid for the iron;

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*Presented at the annual meeting of the Rhode Island Chapter, American Academy of General Practice, at the Rhode Island Medical Society Library, May 2, 1957.

therefore, the disappearance, again is very rapid. In patients with hemolytic anemia, we again see the rapid disappearance of the radioactive iron reflecting active erythropoiesis.

We have found, confirming these observations of others, that the injected iron disappears at a fairly rapid rate from the plasma. Since, as the radioactive iron disappears, the serum iron is assumed to remain the same, one is actually measuring iron turnover by following the rate of decline of the radioactivity. This is plotted on a log scale, and normally within one or two hours, half of the radioactive need has disappeared from normal. In patients not making blood, the decline is much more leisurely.

It is sometimes very helpful to us in evaluating the mechanism of the anemia and possibly the therapy of it to monitor surface areas of patients. We occasionally have cases which may be complicated by extramedullary hematopoiesis, such as, polycythemia, with splenomegaly, and in these patients external monitoring demonstrates the site of erythropoiesis. Cases may also be demonstrated where such studies demonstrate absence of erythropoiesis in marrow, sites of hemolysis, or sites of storage by surface counting of the Fe^{59}.

We might take up two interesting cases in order to demonstrate what use we can make of these studies in helping to decide therapy. The first is a man who came to us with pancytopenia, whose marrow aspiration revealed almost no normal marrow cells, and in whom we gave radioactive iron to try to evaluate his bone marrow function.

The iron disappearance in this patient was slow, thus demonstrating the bone marrow function was sub-normal.

Surface scanning demonstrated that instead of going to the bone marrow, the Fe^{59} went to the liver and stayed there. This reflects iron storage and demonstrates the fact that this patient was producing almost no blood in this marrow.

If he were making blood normally, the blood would be tagged with the iron so that by the end of the week, we should have found anywhere from 80 to 100 per cent of the Fe^{59} in red cells. Instead, his uptake curve was almost zero. Thus the patient's red cell production was just about nil. It is a straight-forward case of aplastic anemia due to lack of marrow function.

The second case was a similar patient with pancytopenia, in whom the only difference was the presence of a palpable spleen. This is a patient in whom we were interested in deciding whether there were two mechanisms, whether hemolysis was playing a significant role in this anemia.

We gave her radioactive iron. The iron disappearance was slow, and consistent with the fact that the bone marrow function was probably subnormal.

Surface monitoring, however, revealed some evidence of uptake in the sacrum, with some gradual discharge, but most of it was backing up into the liver, as in the first case.

There was one major difference, however, in this patient. She was able to take up some iron in her marrow and to make blood, and this is of great importance. The uptake curve demonstrated that this patient was making blood at a significant rate in spite of the fact that in the marrow aspiration, we found almost no erythroid cells. Measurement of total red cell production revealed hypofunctioning marrow.

This patient did have a big spleen, and the possibility of a hemolytic component was investigated by observing the life span of the tagged cells and by calculating the amount of red cell iron turned over daily to maintain equilibrium. The results demonstrated evidence of brisk hemolysis, and with this information at hand, splenectomy was done.

Postoperatively the patient has demonstrated less hemolysis and has been able to maintain her hemoglobin.

Thus a knowledge of iron turnover in an individual patient can sometimes be of great help in determining therapy. A knowledge of iron metabolism in general has also led us to an important conclusion in dealing with adults with iron deficiency. That conclusion is that such a deficiency demands investigation into the source of blood loss.

THE MASTER WORD

With the magic word in your heart all things are possible, and without it all study is vanity and vexation. The miracles of life are with it; the blind see by touch, the deaf hear with eyes, the dumb speak with fingers. To the youth it brings hope, to the middle-aged confidence, to the aged repose. True balm of hurt minds, in its presence the heart of the sorrowful is lightened and consoled. It is directly responsible for all advances in medicine during the past twenty-five centuries. Laying hold upon it, Hippocrates made observation and science the warp and woof of our art. Galen so read its meaning that fifteen centuries stopped thinking, and slept until awakened by the De Fabrica of Vesalius, which is the very incarnation of the master-word. With its inspiration Harvey gave an impulse to a larger circulation than he wot of, an impulse which we feel to-day. Hunter sounded all its heights and depths, and stands out in our history as one of the great examplars of its virtues. With it Virchow smote the rock and the waters of progress gushed out; while in the hands of Pasteur it proved a very talisman to open to us a new heaven in medicine and a new earth in surgery. Not only has it been the touch-stone of progress, but it is the measure of success in everyday life. Not a man before you but is beholden to it for his position here, while he who addresses you has that honour directly in consequence of having had it graven on his heart when he was as you are today. And the Master-Word is Work, a little one, as I have said, but fraught with momentous consequences if you can but write it on the tables of your heart, and bind it upon your forehead.

SIR WILLIAM OSLER (1849-1919)

PRESENT STATUS OF CARDIAC SURGERY*

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EVER SINCE cardiac surgery came into being, it has been the objective of the cardiac surgeon to be able to open the heart and repair defects inside the heart with the same care and precision with which he is now able to work on other internal viscera. In lecturing to our medical students in 1941 and 1942, I predicted that within five years this feat would be accomplished, because at that time, working in the laboratory at the University of Pennsylvania School of Medicine, Gibbon[1] had already developed a machine with which he was able to bypass the heart and lungs of the cat for thirty minutes. However, the war came and a great number of technical problems arose in the heart lung machine, so that instead of five years, fifteen years have passed and we have just now come to the stage of being able to use the heart lung machine in clinical surgery with considerable confidence. Although there unquestionably are many ways in which the present machines may be improved and many refinements will be developed, nevertheless, at the present time, the cardiac surgeon is faced more with the problem of which patients to operate upon on the heart lung machine and exactly what to do once the heart is opened, than whether or not a satisfactory machine is available.

Ventricular Septal Defect

The ventricular septal defect is one lesion in the repair of which the heart lung machine is essential. Efforts to repair the defects blindly or under hypothermia have not met with great success. We believe that the time will come when a patient with a ventricular septal defect will be operated upon as an elective procedure very much in the same manner as we now operate upon a coarctation of the aorta or an indirect inguinal hernia. At the present time, however, we are postponing operations upon patients who are perfectly asymptomatic with normal pulmonary artery pressure. On the other hand, if the pulmonary artery pressure has already reached the stage approaching that of the systemic circulation, we are hesitant to operate upon such patients, feeling that the chances of success are very low. The patients in whom we are advocating operation at the present time are those with some elevation of the pulmonary artery pressure, but not yet approaching that of the systemic circulation. A pressure in the neighborhood of 50 millimeters of mercury is our choice at the present time, our feeling being that those with a normal pulmonary artery pressure will probably not get into trouble in the immediate future and that technics may improve by the time they should be done as elective procedures.

Once the patient is placed on the pump oxygenator and the heart and lungs are bypassed, the ventricular septal defect is approached through a right ventriculotomy incision. There are three methods which have been used in closing ventricular septal defects. If the defect is small, direct suture of the defect has been commonly used. When the defect is a little larger, the sutures have been placed in the defect and tied down over a pledget of ivalon sponge, thus allowing less tension on the sutures and less likelihood of their being pulled out. When the defect is sufficiently large, a patch of ivalon sponge is sutured in place, with no tension whatever on the suture line, except for that brought about by cardiac action.

Atrial Septic Defect

We have found closure of atrial septal defects under direct vision, using hypothermia,[2] to be so satisfactory that we have reserved the use of the heart lung machine for those patients in whom we suspect some unusual situation. We feel that an atrial septal defect can now be repaired as an elective procedure in the same manner as a patent ductus arteriosus or a coarctation of the aorta, and are willing to advise operation in children from five to ten years of age, even though they are asymptomatic. The operation is easily done at this age and, we believe, with very little risk. We believe that there are a number of factors which have reduced the risk of this operation.

Except in adults or children with very large hearts, we find that adequate exposure can be obtained through a fourth interspace incision on the right side, carrying it entirely around to the sternum. We have been going across the sternum only

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*Presented at the 146th Annual Meeting of the Rhode Island Medical Society, at Providence, Rhode Island, May 1, 1957.

in unusual patients. This cuts down the magnitude of the procedure and the postoperative pain, so that these children now get along just about like a child with a patent ductus arteriosus. The pericardium is opened and the superior vena cava, inferior vena cava and right-sided pulmonary veins are freed widely as a preliminary procedure. This is done so that when the sutures are placed in the septal defect tension upon the septum will be reduced to a minimum. The aorta is also freed preparatory to circulatory occlusion. The temperature is taken down only to 90 degrees and we feel that this is very important in the avoidance of ventricular fibrillation. It is often difficult to arrive at exactly the temperature desired at the time of circulatory occlusion and, as a matter of fact, we feel perfectly happy if the temperature is somewhere between 86 and 92, but prefer it not to go below 90 degrees F. This, of course, limits the time that circulatory occlusion may be utilized, and we have adopted the rule that if it appears at the end of four minutes of circulatory occlusion, the suture cannot be completed within an additional minute, to clamp the auricle and allow the circulation to return to normal for about a ten-minute period. At that time, a second period of circulatory occlusion may be utilized. In this fashion, we have used as many as four different periods of four minutes each, for a total of sixteen minutes. As a matter of fact, it is only the occasional patient who requires more than one period of four or five minutes. Under this regime, ventricular fibrillation has virtually disappeared except in the very desperate risk patient with pulmonary hypertension.

This technic has become so simple in our hands that we feel there is no real reason for pursuing the closed technic for the suture of atrial septal defects and we believe that the chances of getting complete closure under direct vision are considerably better than by the closed technics.

Pulmonary Stenosis

The patient who has pulmonary stenosis without a ventricular septal defect may be operated upon by a variety of methods. The use of a knife through the right ventricular wall as developed by Brock[3] and by Potts[4] greatly improved these patients but did not always bring the right ventricular pressure down to normal. When one can be certain that the pulmonary stenosis is valvular in type, it can be satisfactorily handled under direct vision through the pulmonary artery, using hypothermia. We have felt, however, that with valvular stenosis, the guillotine-type knife from below gives about as satisfactory results as direct vision from above.

The real problem in this disease, however, is our ability to make an exact preoperative diagnosis of pure valvular stenosis as opposed to a high infundibular-type stenosis. If there is an infundibular pulmonary stenosis, it seems to us that none of the blind procedures is entirely satisfactory and that the use of hypothermia, although it has been successful on many occasions, is by no means ideal. We feel, therefore, that when infundibular stenosis is suspected or, in fact, if one cannot be entirely sure that it is not present, such a patient should be operated upon by means of a pump oxygenator. The only preoperative finding at present which we feel to give absolute evidence of valvular stenosis alone is a characteristic curve on cardiac catheterization. When the decrease in pressure is obtained immediately beyond the valve, by the Venturi effect, we so far have not been fooled on its being a valvular stenosis. In the absence of this finding, we are hesitant to assume that the stenosis is only valvular and that no infundibular stenosis is present. When the patient is operated upon on the heart lung machine, we have approached it through a right ventriculotomy and the procedure, of course, is exceedingly simple, and the time on the machine is usually fifteen minutes or less. If an infundibular stenosis is present, it can be removed easily under these circumstances. The result for this lesion should be excellent.

Tetralogy of Fallot

We agree, at least on a theoretic basis, that patients with the tetralogy of Fallot should be operated upon under direct vision by means of the heart lung machine,[5] and yet we are not doing that on all of our patients at the present time. We believe that it should be used, however, on the child who can survive perhaps to its fourth year and attain sufficient size so that the operation can be carried out without too much difficulty. A good many things need to be learned, we feel, as far as the technical problems involved in the repair of the tetralogy of Fallot are concerned and, at the present time at least, we believe that an ivalon patch will be necessary in a great many of these patients because of the size of the defect. We agree, however, that as soon as surgeons throughout the country obtain the technical *know-how* to correct this complicated anomaly, this is the method of choice.

At the present time, however, we are still using the shunt procedure on children under three or four years of age and it may well be that this practice will continue for some time. It would certainly seem that there is an occasional patient in whom it will not be possible to re-establish pulmonary flow sufficiently from the outflow tract of the right ventricle so that the shunt procedure, either by the Blalock or Potts method, may continue to be necessary.

It has been our practice in the past, to use the Potts operation on infants in the neighborhood of ten pounds or so. When the child attains the size

of twenty pounds, we have used the Blalock procedure. Our experience with the Potts procedure is that we have apparently made the anastomosis too large in a good many infants and the hearts have become larger than we should like.

Tricuspid Atresia

The blue baby upon whom a diagnosis of tricuspid atresia has been made is subjected to the shunt-type procedure. We are not familiar with any technic, at present, which would allow the correction of this lesion by the direct approach. There is some concern at the present time as to whether something more than the simple shunt procedure may be required in some patients. Blalock[6] has suggested that the atrial septal defect be made larger in some patients, for fear that the flap-like valve on the foramen ovale may be closed by the increased pulmonary flow to the left auricle by the shunt procedure. Whether the right heart failure which occasionally occurs following the shunt can be corrected by increasing the size of the atrial defect is uncertain at this time.

Transposition of the Great Vessels

It would seem that transposition of the great vessels by use of the pump oxygenator could be accomplished satisfactorily. To date, however, this has not proved to be the case. One of the difficulties about using the heart lung machine is that these patients are usually operated upon in infancy and the problems involved are many. Unfortunately, it is not possible simply to transplant the pulmonary artery and aorta to correct this condition because the coronary arteries would continue to arise from the venous side of the circulation so that the corrective procedure must involve the transplantation of the carotid arteries as well. Many attempts, therefore, have been directed toward the transplantation of the great veins, as opposed to the arteries, and it may well be that that will be the more fruitful method of persistent efforts. The procedures which have been most successful to date, have been the production of a large atrial defect, as suggested by Blalock, to allow better mixing between the two sides, or the transplantation of a portion of the venous circulation as suggested by Baffes and others.

Coarctation of the Aorta

Operations for coarctation of the aorta have now become quite standardized and there would seem to be no place for the heart lung machine in the handling of this condition at the present time, with the possible exception of the infantile type of the disease. This is a fairly uncommon lesion and has proved to be very difficult surgically. It should be correctable by means of the machine, if the problems of working on such small infants can be overcome with the machine.

We feel very strongly that the child with coarctation of the aorta should be operated upon before he reaches his teens and that the ages of four to ten are ideal. We believe that the vessels are more elastic at this time and it will seldom, if ever, be necessary to use a graft in such patients. So far, we have never used a graft in a child, although we have resorted to various types of plastic procedures on the arteries in order to overcome the defect. The risk of the operation in a child is minimal.

The adult with coarctation should not be operated upon without some type of prosthesis being available in the way of a homograft or plastic prosthesis, in the event that it should be needed. Whereas we formerly regarded age as a contraindication to operation, we now feel that age is not a contraindication, the oldest patient we have operated upon having been fifty-five years of age. We feel that all patients with coarctation of the aorta should be operated upon and that the risk of operation in all groups should be less than 5 per cent.

Patent Ductus Arteriosus

The operation for patent ductus arteriosus is now well standardized. We feel that triple ligation with silk is satisfactory in the vast majority of patients, and in more than 200 such operations we are not aware of a single recannulization of the ductus. On the other hand, when the ductus appears to be short and wide, we routinely divide it and suture the two ends. We feel that the risk of operation upon the patient with a patent ductus arteriosus should be no greater than 1 per cent and that all patients with the lesion should be operated upon as a matter of election. The oldest patient upon whom we have performed the operation was forty-seven years of age.

It is our custom, at the present time, to operate upon these patients whenever the diagnosis is made, if it is convenient to do so at that time. It is only the occasional patient on whom the operation is done as a semi-emergency procedure, within the first few months of life, because of a tremendous left to right shunt and increase in cardiac size.

The only real problem, at the present time, in patients with patent ductus arteriosus, is the question of pulmonary hypertension. In the presence of severe pulmonary hypertension, the diagnosis usually has to be made on the basis of cardiac catheterization or aortography because the continuous murmur is no longer present. At the present time, it seems to be the consensus of opinion in the surgical literature that if, when the ductus is occluded at the time of operation, the pressure does not increase in the pulmonary artery, the ductus should be closed. If the pressure in the pulmonary artery increases, then the temporary occlusion should be removed and the ductus allowed to remain open. It is reported that most patients with patent ductus

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CORONARIES AND CORN OIL

THE RELATIONSHIP between atherosclerosis and dietary habits has long been a matter of speculation. That it is a metabolic disease is self-evident. From time to time dietary regimens have been proposed or prescribed in an effort to control the onslaught of the pathological process which is the quintessence of aging. Current preoccupation with coronary artery disease has rekindled this interest. The latest wrinkle to stir the public imagination is the business of unsaturated fatty acids. The matter has been spread far and wide in the public press and popular magazines. It is rumored that some of our more impressionable colleagues have succumbed to the extent of altering their own culinary customs. The public is entitled to an intelligent appraisal of this new fountain of youth.

Some years ago it was observed in a study of post-mortem material in Kenya colony that a Negro tribe in that locality had a very low incidence of atheroma. It was believed at the time that this was due to a high protein intake. A more recent survey in multi-racial Capetown, South Africa, elicited the information that there was a widely differing interracial incidence of coronary heart disease, and furthermore that this difference was associated with a parallel alteration in the mean serum cholesterol. Further probing led to the significant observation that within each racial group the serum cholesterol level was highest in those living at the top economic level and bore a direct relationship to the intake of foods rich in fats of animal origin. No such correlation could be detected with respect to the intake of vegetable fat. It was the conclusion of the investigators that animal fats and hydrogenated vegetable fats behaved differently from vegetable and marine fish and mammal oils. The most likely common difference, they felt, between these fats and oils is the proportion of unsaturated and saturated fatty acids in the fats and oils concerned. This could lead to an interesting explanation of the low incidence of the disease among Eskimos.

Keys in 1952 reported that the cholesterol concentration in the serum of man is substantially independent of the dietary cholesterol intake over the whole range of possible human diets. He did find, however, that the serum cholesterol of men habitually on diets characteristic of the United States was altered directly with changes in the total fat content of the diet. He further observed that a lowering of the serum cholesterol followed very promptly in a matter of a few days after a reduction in the fat intake. He detected no difference in this response in the case of animal or vege-

table fats.

Ahrens, however, who had noticed a reduction in lipid levels following the feeding of plant fats, observed that this reduction was dependent upon the specific fat fed. A group of Swedish workers then embarked upon a series of long-term feeding experiments using various saturated and unsaturated fatty acids. A major technical problem revolved about making corn oil in foods palatable over a sufficiently protracted period. This they apparently succeeded in doing. As a result of these studies they concluded that the cholesterol depressing effect of certain fats is related to their content of polyunsaturated fatty acids.

It is perhaps not unnatural to accept these deceptively lucid experiments as constituting definitive proof. So far, however, all conclusions must be considered tentative and subject to further confirmation. There are also many variables involved, the influence of which may not have been adequately appraised.

Recently, words of caution have emanated from a number of sources warning against prescribing difficult diets without adequate proof of their efficacy. The JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION has commented as follows: "Unfortunately many premature uncritical, and even erroneous statements have appeared in numerous non-scientific publications which are widely read. The general public needs guidance from the medical profession in interpreting such articles." In the exhaustive symposium which followed, there appeared the following statement: "The hypothesis that dietary fats affect atherogenesis, however plausible and appealing, remains unproved." Elsewhere in the Journal can be found the following: "The diet has been implicated in the genesis of atherosclerosis. . . . There is no present evidence which calls forth a recommendation for drastic changes in the present dietary regimen to combat atherosclerosis."

An extensive report rendered jointly to the American Heart Association and to the American Society for the Study of Arteriosclerosis reaches virtually the same conclusion.

It behooves us to keep a balanced view in this matter, and not sway to every experimental breeze that blows our way.

MR. FORAND PROPOSES

IN THIS ISSUE the report of the Washington Office of the American Medical Association is published, summarizing all action taken on health measures up to the time of the adjournment of Congress on August 30.

Commenting on the work of the Congress during the recent session, Doctor Thomas Alphin, director of the A.M.A. Washington Office, notes that "the small number of health-medical bills enacted this year might be regarded as deceptive. Actually 441 of these bills were introduced—a record total even for a first session. Congress deferred action on most of them for a variety of reasons—a desire for more extensive hearings, economy, and, possibly, an inclination to save some popular appeal bills for next year. Experience has shown that the second session, always an election year, is a crucial one, when forces line up for final decisions on the big controversial medical bills.

"For example, no action was taken this year on such important measures as United States aid to medical schools and health insurance for federal civilian workers, nor on a growing list of ideas for government-paid hospitalization of Old Age and Survivors Insurance beneficiaries, a proposal that would have an obvious impact on the practice of medicine. . . ."

Rhode Island has a particular interest in the revival of proposals for hospitalization for OASI recipients, for the most generous of the give-away proposals this year was introduced by Aime J. Forand, Congressman from the first district of this state. Congressman Forand—in spite of the fact that the Blue Cross in his home state has led the nation in the enrollment of the eligible population that can be covered, and in spite of the fact that our Physicians Service has the second highest per capita coverage for surgical benefits for one of the most liberal of the voluntary programs in the nation—wants to change the pattern now and tax the citizens of Rhode Island to give 120 days of hospital or nursing home care to every person receiving old age and survivors insurance retirement benefits, plus payment for surgical services certified as necessary by the physician.

In addition, Mr. Forand would like to have every OSAI beneficiary receive an increase from the present range of $50 to $200 per month to a range of $55 to $305 per month for retirement or disability benefits. The money to pay for this added program would presumably come from the people still willing to work, who would pay an extra one-half per cent, together with an extra one-half per cent from the employer, on income up to a new ceiling of $6,000 (present limit $4,200).

Mr. Forand has expressed gratification that Mr. George Meany, president of the AFL-CIO, has endorsed his proposal as being necessary. Does Mr. Meany speak for the taxpayers of Rhode Island, and the United States? Or, does Mr. Meany speak for his organizations' chieftains who consider anything necessary that improves their status at the

continued on next page

expense of the general public?

Mr. Forand has stated that "other important groups and many individuals have also indicated their interest in higher cash benefits and in insurance provisions to cover hospital costs and other health benefits for OASI beneficiaries." He doesn't indicate who the *important groups* are, and until he does such generalizations freely asserted may be as freely denied.

What Mr. Forand cannot deny, however, is that 65.6% of his Rhode Island people have indicated their interest in a *voluntary system* of surgical care, and 78% have Blue Cross coverage. These are important groups that Mr. Forand might well consider when he makes his plea for federal taxation to pay hospital and surgical costs. The fact that he did not consult Blue Cross or Physicians Service officials in Rhode Island is clear evidence that Mr. Forand is not interested in the voluntary system that the American public has approved to meet health costs, and it is clearer evidence that Mr. Forand is not representing Rhode Island.

In proposing this new phase of federal socialism for an initial 12 to 13 million persons in the first year, Mr. Forand apparently has taken the Dependents' Medical Care Act passed last year and has added to it some of the administrative regulations that the medical profession in Ohio, and Rhode Island in particular, have found most objectionable.

For example, Mr. Forand makes the hospitalization a service-indemnity proposition with the patient free to take better than semi-private accommodations, and the hospital free to charge the patient in such case, but when it comes to the doctor of medicine the fee must be negotiated with the federal department of Health, Education and Welfare on a full payment basis. As all the states have learned in their negotiations with federal departments and bureaus, you match what they think is best for your area, not what you think is fair and equitable.

Mr. Forand even goes a step further than anyone heretofore in his surgical service program. Free choice of surgeon would be allowed, *provided* the surgeon is certified by the American Board of Surgery or is a member of the American College of Surgeons. Mr. Forand did not get this idea from the Rhode Island Medical Society nor the American Medical Association which represents all the physicians and surgeons of America. But, as noted above, neither did he get any advice from the outstanding voluntary insurance organizations of this state, nor presumably in the nation at large.

Mr. Forand, as a politician, is free to *propose* what he wishes to the Congress of the United States, and he is entitled to his own thoughts, which in this instance may be influenced strongly by the fact that 1958 is an election year. As a legislator he has been derelict in his obligation to the people of Rhode Island who elected him as their representative when he failed to consult the major organizations in the health fields here, such as the Hospital Association, the Blue Cross, Physicians Service, or the Rhode Island Medical Society.

Both industry and the general public of Rhode Island, who have given this state one of the finest records in the nation for the support of a most liberal voluntary health insurance program, and who would bear the burden of taxation for any such scheme as Mr. Forand proposes, deserve a much better explanation than the Congressman from the first district has given to-date.

TO A GRACIOUS LADY

A YEAR AGO, Rhode Island Hospital lost one of its most devoted and loyal supporters — Estelle Perkins, R.N., Director of Peters House and "mother" to all the interns and residents who have been there since its opening in 1931. In the midst of our busy program, let us pause for a moment to pay loving tribute to her memory.

She was more than Director of Peters House. She had a rare gift for understanding people, and gave of herself freely in creating a home for the young doctors. No effort was too great if it would provide comfort for her boys; no program too difficult, if it would add to their happiness. She loved them, she scolded them, and always defended them. She was their friend and champion in time of trouble, and one of the first to rejoice in their successes. She was not blind to faults, but her deeper insight enabled her to overlook lesser failings and emphasize basic good qualities that she knew were present. Never would she believe that her faith and patience were not justified.

She was entrusted with many confidences, and more than one perplexed intern benefited from her wise counseling. She was good company, and members of the visiting staff often dropped in for a chat with her. To those who needed it, she gave encouragement; in bereavements, tactful sympathy; and she took a lively interest in love affairs. Usually, she was the first to know when the "right girl" had been found. Nor did this friendship cease when her boys went away. At Christmas time, she

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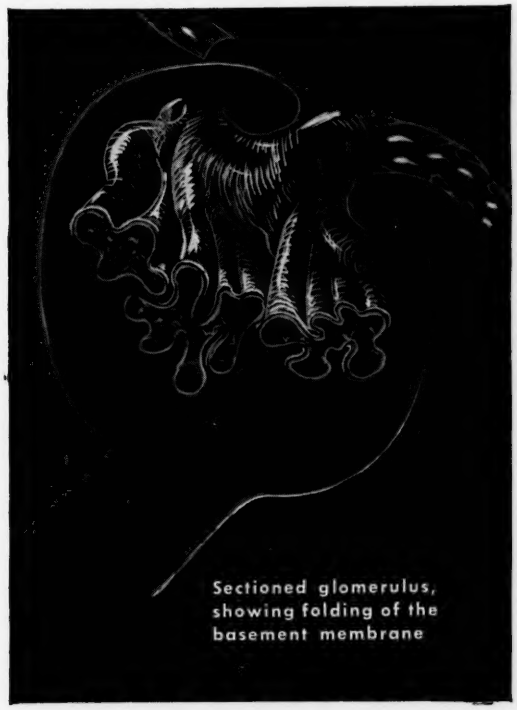

Sectioned glomerulus, showing folding of the basement membrane

*Settel, E.: Rolicton® (Aminoisometradine), a New, Nonmercurial Diuretic, Postgrad. Med. *21*:186 (Feb.) 1957.

SEARLE

ATTENTION: CONGRESSMAN FORAND

Nine out of ten people in Rhode Island have some form of prepaid hospital care, and eight out of ten have surgical care, statistics released by the Health Insurance Council indicates.

Figures prepared by the Blue Cross on the basis of information supplied by the Council show that 79.01% of the state's population are members of Blue Cross; 9.43% are members of other plans offering prepaid hospital care; and an estimated 1.86% have protection extended through Medicare, the government health-care program designed for dependents of servicemen.

Stanley H. Saunders, executive director of Blue Cross and of the R. I. Medical Society Physicians Service, states that a total of 718,000 in the State have hospital care protection. He added that 639,800 have surgical protection, with Physicians Service extending protection to 63.16% of the state's population, 1.86% under Medicare, and 15.36% having coverage in other plans. He said that 647,800 in Rhode Island have medical prepayment plans with Physicians Service having enrolled 63.16% of the state's population, an estimated 1.86% under Medicare and 16.36% having other coverage.

Rhode Island, with 90.3% enjoying some form of prepaid health care, leads all other states in total percentage of population protected. The Health Insurance Council, which is a federation of 8 insurance associations representing over 90% of the accident and health insurance business handled by insurance companies, reported that over 70% of the U. S. civilian population had some form of health insurance.

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TO A GRACIOUS LADY

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kept in touch with doctors all over the world, still showing the same kindly concern for their families and welfare that she had when they were at Peters House. She kept all the pictures that they sent her of their numerous offspring, and she often spoke with great pride of her many "grandchildren."

There were other talents, too. She could do up a beautiful gift package for a sweetheart, and knew just what to say to visiting relatives. She raised African violets that were a joy to behold, and had a windowbox full of them in her office. She loved music, especially symphony and opera, and often spent a happy week end in Boston or New York seeing a new play.

But perhaps those who knew her well like best to remember those wonderful dances that she used to give at Peters House. She had a flair for decoration and atmosphere. With a few magic touches, she could transform a formal lounge into a make-believe Casbah or Parisian cabaret for a gay party. And she herself would always attend, in a lovely gown, her hair beautifully waved, and wearing the orchid that the boys would always send her. She made a delightful hostess, and was as gay as any of her light-hearted guests. As one doctor put it, "She always manages to add a touch of glamour to everything she does, and sparkle to even the simplest occasion." The highlight of her evening was always a waltz, reserved for her by one of the best dancers. This she enjoyed tremendously—and so did the doctor. When it was over, she would say rapturously, "That was a great thrill," then (under her breath) "Oh, how my feet hurt!"

Yes, she was more than the "director" of Peters House. She created it. To those of us who were privileged to know her she will live on in memory as a truly gracious lady.

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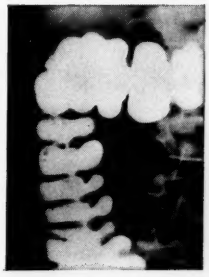

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NON-HOSPITALIZED TUBERCULOSIS PATIENTS IN RHODE ISLAND

Report of Plans for a Statewide Study

All of Rhode Island's physicians and public health nurses have been enlisted in support of a study just getting under way to define the status of non-hospitalized tuberculosis patients.

The study, which has been endorsed by the Rhode Island Medical Society, is jointly sponsored by the Division of Tuberculosis Control, State Department of Health, and the Rhode Island Tuberculosis and Health Association, through the latter's 1956 Christmas Seal sale. Cooperating are medical and nursing consultants and statisticians of the Public Health Service, Department of Health, Education and Welfare.

Following an extensive survey of all tuberculosis facilities and services undertaken last spring by the association, both sponsoring agencies became acutely aware of the non-hospitalized patient. The study suggested that information could be broadened or brought up to date in perhaps half the state's known cases.

As set forth in a schedule outlined for all cooperating workers, the purpose is to learn "more about the clinical status, medical supervision, and work recommendations of the non-hospitalized tuberculosis patients as well as all nursing and social services being utilized by them. This information will serve as a basis for determining how existing facilities and services can be better utilized, and what, if any, additional treatment and rehabilitation facilities are needed."

Doctor F. G. Ruest, director of the Division of Tuberculosis Control, has written to all physicians in the state asking for their cooperation in reaching the objective, which is "to determine the present status of the non-hospitalized patient, the current stage of activity of his disease according to most recent chest X-ray and bacteriological studies, as well as current recommendations for treatment."

He also asked the cooperation of the medical profession in the event its members received calls from a public health nurse engaged in gathering information. He suggested that any tuberculous patients in their care not yet reported to the Division be so at that time, so the nurse can be of aid in determining whether or not patients are following all recommendations.

Cases for study fall into the following categories:

1. Active.
2. Activity undetermined, but probably active.
3. Inactive with chemotherapy prescribed.

It is also hoped that more can be learned about unreported cases diagnosed prior to October 1 (study date opening), or of other cases not initially selected but qualifying for the study. Such examples the schedule cites as the following:

1. Cases known to have been discharged from the hospital but now eligible for study.
2. Significant cases who are relocated in the course of the study.
3. Cases with activity undetermined or not stated as of October 1 found to meet study criteria.
4. Cases not considered significant for intensive public health supervision as of October 1 but subsequently found with disease reactivated.
5. Patients with inactive disease with drug therapy recommendations discovered on inquiry, for whom therapy prescriptions were not previously known.
6. Cases not known to Health Department on October 1 but revealed through study investigations.

Pointing up the importance of the state study was a recent nation-wide one conducted by the Tuberculosis Program of the Public Health Service, which found 23% of all active and probably active cases under no medical supervision. (See *The Unhospitalized Tuberculosis Patient: A Community Responsibility*, Rhode Island Medical Journal, August, 1957, p. 454.)

Both sponsoring agencies in Rhode Island know the importance to the patient of social aspects of his life. The complete record will consider social problems which are of sufficient importance to interfere with the care of the patient or the health of his family or the public, such as income, housing, vocational needs, marital or family conflict, alcoholism, mental illness, and religious, language or educational differences.

Major work in compiling the records will fall on the Visiting Nurse Associations and Public Health nursing groups, who have already held orientation meetings and received copies of the schedules to be filled out. Doctor Ruest has detached Miss Catherine Sullivan, the Division's nursing consultant, as adviser to the researchers until the study is finished.

Collection of all required information will be completed by December 20. Editing, coding and tabulating data are scheduled for completion by February, and the study will be concluded with analysis of the information and program planning based on the needs the study may reveal.

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PRESENT STATUS OF CARDIAC SURGERY

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arteriosus and pulmonary hypertension, who have their ductus closed successfully, will have a gradual fall in the pulmonary pressure toward normal, over a period of months or years. We have had, however, two exceptions to this, one patient who continued with apparent pulmonary hypertension and died a year or more after operation, and the second who had a cardiac catheterization a year following operation which indicated that the hypertension was slightly higher than it was at the time of operation.

Mitral Stenosis

The operation for mitral stenosis has become fairly well standardized over the years, and yet every surgeon who operates upon this condition feels that new technics and improvements in technics are needed. The approach through the left auricular appendage is still the standard approach, although the right-sided approach through the interatrial groove is used more and more, particularly for recurrent operations. The greatest cause of death following mitral stenosis is probably embolism, either from blood clots knocked off at the time of operation or subsequently, or from calcific emboli knocked off calcific valves as the valves are opened.

The question of the method of opening the valve is always of interest to the surgeon and each surgeon has his own method by which he feels he can do best. We feel that we can open the majority of valves by finger fracture but that the use of the knife, particularly on the anterior commissure, is often necessary. The question of refusion of the valve is one which is facing us constantly. It is a question about which it will be very difficult indeed to come to a definitive conclusion. Since the operation is done as a blind procedure, it is difficult to be exactly certain how much of the valve was opened in the first place and therefore how much has refused.

The risk of mitral commissurotomy is certainly very low in the so-called good risk patient and is comprised almost entirely of the danger of embolic phenomena. Certainly the risk in the so-called good risk patient is less than 5 per cent. The over-all risk, of course, will depend upon the type of patient being operated upon and might well run to 10 per cent or more, if desperate type patients are accepted for operation.

The surgeon, on many occasions, finds the mitral valve so badly calcified that there would seem to be no obvious solution for the condition other than the removal of the valve and the insertion of a new one. It may well be that this objective can be accomplished by the use of the heart lung machine some time in the future. It is difficult to believe that it will ever be common practice to operate upon all patients with mitral stenosis under direct vision on the heart lung machine. At the present time, however, it would seem to us that the only condition of the mitral valve which justifies operation under direct vision on the heart lung machine is that of mitral regurgitation. At present we feel there is no really entirely satisfactory operation for mitral regurgitation and that all of the methods being used should be considered as experimental. It would seem desirable to carry out some of these procedures under direct vision and we are hopeful that this technic may be further advanced in the not too distant future.

Aortic Stenosis

The present operations for aortic stenosis, while very helpful, are not quite so good as those for mitral stenosis. This may be partially due to the difference in the history of the two diseases. If a patient has pure aortic stenosis, he is usually conscious of his disease but suffers very little incapacity from it until his left ventricle suddenly begins to fail. His life expectancy at that time may be very short, so that the patient who feels that he has enough in the way of symptoms from his disease to undergo an operation, is much closer to the end of his rope when he has pure aortic stenosis than when he has mitral stenosis. Likewise, the amount of disease in the aortic valve can be much more severe than that in the mitral and the left ventricle is still able to force the blood through it in the aortic location, whereas the left auricle cannot force it through in the mitral location.

There are several methods of approach to aortic stenosis being used at the present time. One is by the insertion of a dilating instrument through the left ventricular wall and dilating the aortic opening blindly. A second method is by the use of an artificial tunnel on the side of the aorta for insertion of the finger to open the aortic valve by finger fracture. The third is by means of direct vision through the aortic approach by means of hypothermia or the heart lung machine. We have used all three of these methods and at the present time have gone back to the transventricular approach. We feel that it is important to use a relatively small instrument so that the opening in the ventricular wall can be made in an oblique manner to decrease the injury to the ventricular wall and decrease the amount of bleeding that occurs from it. We think that it is also important not to dilate the calcified aortic valve too severely for fear of causing irreparable damage to the surrounding tissues. We believe that by means of using a small dilator rather than the much larger one used previously, our mortality has been greatly reduced. The dilator which we are currently using is the one suggested by Mr. Brock for the pulmonary valve and the blades open for only one

and a quarter inches.

When aortic stenosis is associated with mitral stenosis, it has been our experience that both valves may be opened with no more risk than the mitral alone, as judged by the preoperative condition of the patient. In other words, the left ventricle apparently is protected from tremendous hypertrophy by the mitral stenosis and the complications involved with that condition are not present.

It would seem to us that the replacement of an aortic valve is likely to be done satisfactorily at a much earlier date than that of the replacement of the mitral valve. This is primarily because the annulus of the mitral changes so much more in size than the annulus of the aortic during systole and diastole. Replacement of the aortic valve is badly needed, particularly for aortic regurgitation. The Hufnagel valve has met with certain success but we have not been entirely happy with its use and, as far as we are aware, all methods used in the treatment of aortic regurgitation at the present time must be considered in the experimental stage.

Coronary Insufficiency

There are a number of surgical procedures which are being used for coronary insufficiency. Beck[7] has worked longer in this field perhaps than any other surgeon and he feels very strongly that patients with coronary insufficiency are improved by the Beck I operation which essential is scarification of the epicardium and the inside of the pericardium, with the introduction of an irritant such as asbestos and the partial occlusion of the coronary sinus. A number of types of procedures have been carried out. Harkin has suggested the use of 90% phenol for the scarifying agent and has not used a foreign material. In our hands, this has the advantage of not drying the heart at the time of introduction and decreasing the likelihood of immediate postoperative hypotension.

The greatest difficulty in judging the value of these operations is the problem of satisfactorily evaluating the patients. I think that I can truthfully say that, with few exceptions, the patients whom I have operated upon for this condition have felt that they have been improved by the operation and said that they were glad they had it done. On the other hand, I am sure that it takes a pretty stout individual to have such an operation performed and then admit that he wasn't improved. One of the great difficulties, of course, is that many patients with coronary insufficiency improve as they develop their own collateral circulation, so that it has been difficult over the years to evaluate properly this procedure. As far as I can make out, however, from the factual data which have been arrived at, I am convinced that the blood flow to the myocardium is increased by these various procedures and that, in

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a good many patients, the amount of increase is sufficient to improve their state of well-being. Time alone and a great deal of effort in the evaluation of postoperative patients, as opposed to patients who have not been operated upon, must tell us whether the difference is sufficiently great to justify operation on all such patients.

SUMMARY

The present status of surgery as it involves certain cardiac lesions has been discussed. We are now in the early phases of the clinical use of the heart lung machine and the real problems now facing the surgeon, as well as the clinician, are primarily, which lesions can be corrected without the use of the machine and which lesions require the use of the machine for satisfactory correction. The surgeon must still perfect certain technics for the correction of intracardiac lesions and we must look forward to further development of machines and prostheses in order to correct the many defects which occur in both congenital and acquired cardiac disease.

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RECENT ADVANCES IN THE UNDERSTANDING AND MANAGEMENT OF CEREBRAL VASCULAR DISEASE

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control of atherosclerosis) have been omitted deliberately for lack of time. Most of these receive adequate attention in three recent monographs.[24, 25, 26]

It is safe to say that a more dynamic approach to the diversified clinical, social, and economic problems presented by cerebrovascular disease is already proving its worth. Only a multifactorial approach can be expected to lead to more rational and successful therapy.

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THE WASHINGTON SCENE

A summary prepared by the Washington Office of the American Medical Association of the Congressional scene, with Health Legislation enacted, and that upon which hearings have been held, but no further action taken

IN THE last few years interest has built up in the problems of the older people—how they are to get their bills paid, how to spend their time constructively, what chronic medical conditions are causing them the most trouble. Innumerable national and local conferences have searched for ways to make life more satisfying and healthy for people entering old age, and committees are at work on the problem in thousands of communities.

In this favorable climate, when every device that might help the older citizens is being examined, there is being revived a scheme that met with no success at all when first proposed more than six years ago.

It is a plan for government-paid hospitalization under the Old Age and Survivors' Insurance system.

Here is the argument that is made for it:

People in old age generally have less income than when they were younger, but at the same time they require more medical attention and hospital care. Neither voluntary nor commercial health insurance has been able to offer these people the protection they need. The only solution, sponsors of the plan say, is to get the federal government into the picture.

Opponents of the idea agree that older people are sick more often and generally don't have much money, but they disagree violently with the other arguments. They point out that slowly but surely insurance coverage is being extended to older people at a price they can afford to pay. Most important, hospitalization-at-65 critics maintain that a system like this is in effect national compulsory health insurance under Social Security.

Early this year Reps. Emanuel Celler (D.,N.Y.) and John Dingell (D.,Mich.) introduced bills on this subject. They would allow 60 days a year free hospitalization for OASI-covered men 65 and over and women 62 and over. Rep. Kenneth A. Roberts (D.,Ala.) offered a similar bill.

Just before the session ended two developments occurred that are evidence the proponents of this system of hospitalization are getting ready to make a real fight for it next year.

First, Rep. Aime J. Forand (D.,R.I.) presented a bill that would make extensive liberalizations in the social security program, including creation of a hospitalization plan that would give free surgical service to the aged program. Some national labor leaders immediately pledged their support to this bill, a not unexpected move as the AFL-CIO is officially behind the general idea.

Then Senator Richard L. Neuberger (D.,Oregon) made it plain he, too, wanted the old people to have free in-hospital medical care. The senator said he hadn't firmed up his thoughts, but that he believed the best approach would be something like the Military Dependent Medical Care program (Medicare), making use of Blue Cross or other nonprofit groups. He estimates that a 1% increase in payroll taxes for both employer and employee would meet the extra costs.

Mr. Forand, on the other hand, is specific. He would make all persons receiving OASI retirement benefits eligible and also surviving widows and children, but would not include persons receiving OASI disability payments. He would broaden the time period by allowing 120 days of hospital or nursing home care each year, with hospital stays limited to 60 days.

The Forand measure also has a provision, not contained in most earlier bills, for OASI also to pay for in-hospital surgical services certified as necessary by the physician.

Mr. Forand would take no chance of running out of money. He would levy social security payroll taxes on all income up to $6,000 (present limit $4,200), and also increase the tax rate a half per cent for employer and employee alike, and three-quarters of one per cent for the self-employed.

It is almost certain that these and other similar suggestions will receive serious consideration by Congress next year, with passage of a bill much more likely than in 1951 when President Truman and Oscar Ewing first proposed the idea.

Interim Report on Health and Medical Legislation

Below is an interim report on health and medical legislation in the 85th Congress. It summarizes all action taken on health measures up to the time of adjournment on August 30 and lists all significant

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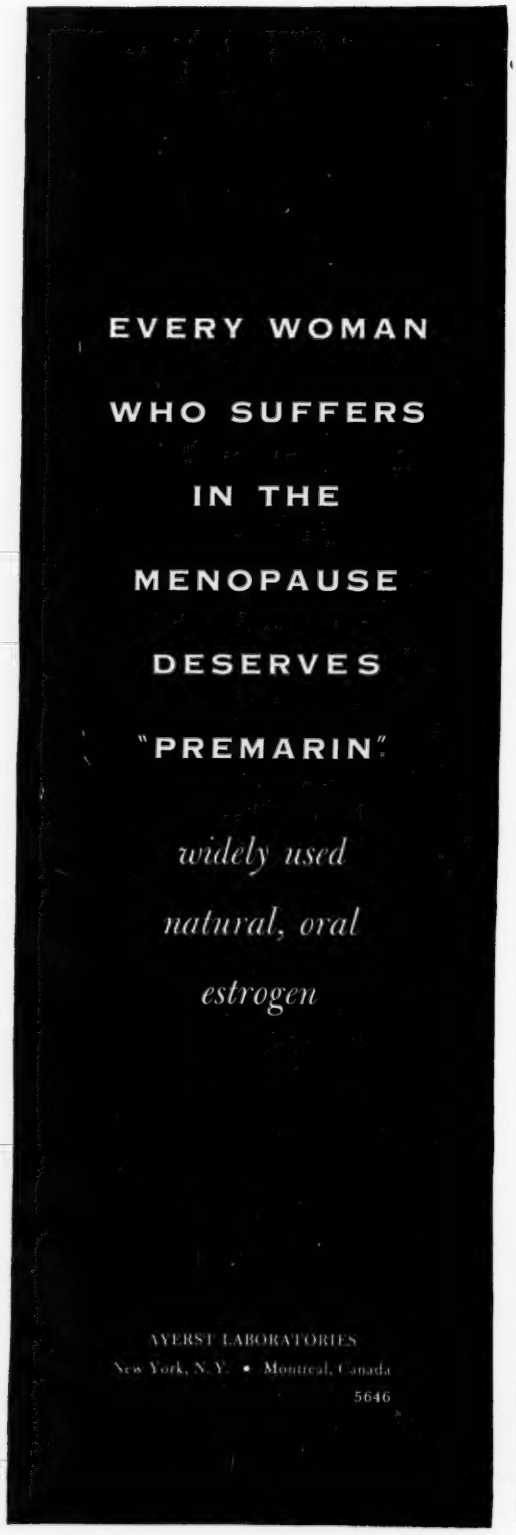

THE WASHINGTON SCENE

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bills that will be awaiting decision in the second session starting January 7, 1958.

Health Legislation Enacted

Doctor Draft Extension (P.L. 85-62)—Because the doctor draft was set to expire July 1, this was one of the first health measures passed by the 85th Congress. It gives Selective Service authority until July 1, 1959 (when both this amendment and the regular draft expire) to call certain physicians up to age 35 for military service. Only those under age 35 with obligations under the regular draft and who have been deferred for any reason may be called. Defense Department, meanwhile, says it is getting enough medical schools graduates as reservists to preclude use of the new law at this time.

Medical Research (P.L. 85-67)—Another early enactment was the fiscal 1958 budget for the Department of Health, Education, and Welfare. Congress voted $2,503,130,381 for all HEW programs, including record high totals for medical research through the National Institutes of Health. Congress can—and in all likelihood will—receive requests from the administration for additional money during the current fiscal year through a deficiency appropriation.

Vendor Medical Payments (P.L. 85-110)—This law is intended to resolve some problems arising out of the social security amendments of 1956 with particular reference to vendor medical payments for public assistance recipients. Under P.L. 110, states are given the choice of either (a) using federal funds for vendor medical payments within the $60 a month per recipient maximum or (b) establishing a single medical vendor payment financed by federal funds which were set by a 1956 law at one-half of $6 a month per adult and one-half of $3 per child, to be matched by states. States also can continue to make direct payments to recipients for medical and subsistence expenses.

Disability Freeze Extension (P.L. 85-109)—Under this law, a new deadline of July 1, 1958 is established for disabled persons covered under social security to apply for full retroactivity under the disability freeze passed in 1954. Applications filed by next July will allow workers to count the full period of disability provided they were eligible for disability benefits at the time the disability was incurred. After next July 1, any period of disability established for a worker cannot begin earlier than one year before the application is filed.

Indian and Non-Indian Hospitals (P.L. 85-151)—At the urging of some Western members of Congress, P.L. 151 was enacted to authorize federal funds to help build non-profit or public hospitals and diagnostic or treatment centers on or near In-

dian reservations; the extent of federal contribution will be determined by the percentage of care given eligible Indians. The facilities have to agree to care for both Indians and non-Indians.

Vocational Rehab Traineeships (*P.L. 85-198*)—This measure extends from two to three years the maximum period of time over which the federal government can pay for partial financing of traineeships in physical medicine and rehabilitation. It amends the Vocational Rehabilitation Act which was expanded in the 84th Congress.

Vocational Rehab Planning (*P.L. 85-213*)—This amends the Vocational Rehab Act by extending the time federal funds may be used for planning, preparing and initiating expansion of programs in the states. Congress was asked to act when the July 1 deadline approached with considerable unexpended funds on hand.

Codification Veterans Laws (*P.L. 85-56*)—Without making any substantative changes in existing law, this Congress brought into a single code all veterans benefit laws, including those providing for hospital and medical care. Some of the laws date back 30 years.

Poultry Inspection (*P.L. 85-172*)—Under this law, federal inspection of poultry moved in interstate commerce becomes compulsory.

Military Nurses Incentives (*P.L. 85-155*)—In line with earlier efforts to make careers in the military more attractive, Congress passed this law improving career prospects for military nurses by making more and higher ranks available.

Bills That Passed One Branch of Congress

Pulmonary Tuberculosis (*H.R. 1264*)—The bill declaring veterans suffering from active pulmonary tuberculosis to be permanently and totally disabled for pension purposes while hospitalized passed the House, but is pending in the Senate Finance Committee.

Hearings Held But No Further Action Taken

Bricker Amendment (*S.J.Res. 3*)—The long-standing proposed amendment to the Constitution by Senator Bricker (R.,Ohio) limiting the domestic effect of treaties and other international agreements.

Civil Aviation Medicine (*S. 1045*) — Would establish in the Civil Aeronautics Administration an Office of Civil Aviation Medicine along with a Medical Research Institute.

Welfare-Pension Plans Registration (*S. 1122, S. 2888*)—Provide for registration, reporting and disclosure of employee welfare and pension benefit plans. Both House and Senate Committee hearings held and some action expected next session.

Highway Safety (*S. 1292*)—Hearings in House but not on any specific bills. Proposals include compulsory installation of safety belts.

continued on next page

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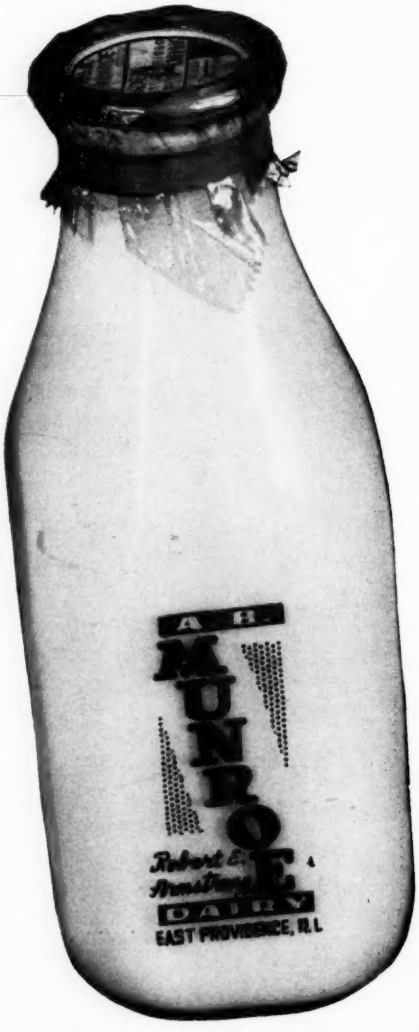

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OVR Pilot Center (*S. 2068*)—Would give the Office of Vocational Rehabilitation authority to use federal funds for construction of facilities for a pilot rehab center in the Washington area.

Non-service-connected Care (*H.R. 58*)—Would impose added requirements on veterans with non-service-connected disabilities seeking hospitalization or domiciliary care in VA facilities.

Barbiturates Control (*H.R. 503 and others*)—Regulate the manufacture, distribution and possession of habit-forming barbiturate and amphetamine drugs, and provides for registration and record-keeping, but with doctors exempted.

Department of Civil Defense (*H.R. 2125 and others*)—Establish a new executive Department of Civil Defense which would have supremacy over the military in times of disaster in certain defense areas.

Salary Rise for VA Doctors (*H.R. 6719*)—Increases salaries of medical personnel in VA, and also raises optometrists to the level of physicians for purposes of pay.

Chemical Additives (*H.R. 6747 and others*)—Require pre-testing of many chemical additives to be used in food processing and marketing. The House has held extensive hearings on this subject.

Grants-in-Aid-Study (*H. Res. 312*)—Provides for a Select Committee of the House to study federal grants-in-aid to state and local governments, and other groups. It got as far as House Rules Committee approval.

Advisory Group for Blind (*H.R. 8427*)—Establishes a temporary National Advisory Committee for the Blind.

Bills Still in Committee; No Hearings Held

Hospitalization for Aged (*H.R. 9467, 9448 and others*)—Various bills provide through different approaches a certain number of days of free hospitalization each year for Old Age and Survivors Insurance recipients and beneficiaries, some bills also would pay in-hospital surgical and medical care costs.

Compulsory Health Insurance (*S. 844, H.R. 3764*)—A 1957 version of the old and rejected national compulsory health insurance measures of 1948, the sponsors being Senator Murray (D., Mont.) and Rep. John Dingell, Jr. (D.,Mich.)

Liberalizing OASI Coverage (*S. 173 and others*)—These measures would liberalize the age and coverage requirements in the OASI disability program.

OASI Coverage for Doctors (*H.R. 8883*)—Physicians would be brought under Social Security on a compulsory basis.

Jenkins-Keogh Plan (*H.R. 9 and 10*)—Defer federal income taxes on portions of earnings of the self-employed for the purchase of retirement plans.

OASI Tax Increase (*H.R. 7669*)—Increases the wage base from the present $4,200 to $6,000 in computing the OASI tax.

Federal Workers Health Insurance (*S. 2339 and others*)—Provide for a voluntary, contributory health insurance program for federal employees and their dependents, both basic and major medical coverage.

Overseas Federal Medical Care (*H.R. 6141*)—Provides health and medical services for U. S. civilians overseas who are employed in government jobs, and also would cover their dependents.

Federal Medical School Aid (*H.R. 6874*)—Authorizes federal grants to medical schools and research facilities for construction of classrooms and laboratories for teaching.

National Radiation Institute (*S. 1228 and H.R. 4820*)—Establish a National Radiation Health Institute within the National Institutes of Health.

Lobbying Amendments (*S. 2191*)—Would rewrite regulations covering lobbyists and lobbying in Congress.

Federal Loans to Hospitals (*H.R. 1979*)—For those hospitals interested in construction loans rather than Hill-Burton grants, these bills would authorize long-term government loans.

Reinsurance (*S. 1750 and H.R. 6506*)—Permit pooling by various insurance companies without regard to the anti-trust laws for purpose of encouraging new experiments in health insurance coverage.

Aid for the Aged (*H.R. 383 and others*)—Authorize grants for studies and projects for the aged.

Federal Advisory Health Council (*H.R. 2435 and others*)—Establish a Federal Advisory Council on Health, as recommended by the Hoover Commission.

Longshoremen's Act (*H.R. 7303 and S. 2400*)—Amend the Longshoremen's and Harbor Workers Compensation Act so that injured workers can select their own physician and hospital.

Labeling for Household Use (*H.R. 7388 and others*)—Regulate the labeling of hazardous substances intended for household use.

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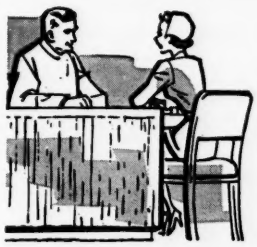

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BOOK REVIEWS

SURGEONS ALL by Harvey Graham, M.D. Philosophical Library. N.Y., N.Y. 1957. $10.00

This volume was first published in 1939 as THE STORY OF SURGERY. An extra chapter has been added to bring it up to date. Its value lies in being a highly readable account of the history of surgery from the earliest known archeologic evidence until the present. The advances of various individuals and groups are recorded together with abundant material about the social and economic background in which they labored.

The book is written for the general public as well as the medical profession, necessitating occasional definitions ("goitre—the enlargement and over-action of the thyroid gland in the neck"). In general, this is well handled.

Any survey volume such as this should be allowed a few errors of fact. In the chapter on Ambrose Paré, the only one which the reviewer is competent to judge in detail, the old error is repeated that Paré, during his training in about 1530, assisted Colot, the great lithotomist. It is well established that Colot did not learn this operation until after 1543, when Paré was already an established barber-surgeon. A few remarks on Paré's role on St. Bartholomew's Eve are given as fact rather than as probability as they should be. These are minor points, and for anyone wishing to study the origins of surgery, this is a good volume to begin with.

THOMAS PERRY, JR., M.D.

ROENTGEN SIGNS IN CLINICAL DIAGNOSIS by Isadore Meschan, M.A., M.D., with the assistance of R. M. F. Farrer-Meschan, M.B., G.S. W. B. Saunders Company, Philadelphia, 1956. $20.00

In this text which may be considered complementary to the author's previously written and well-received ATLAS OF NORMAL RADIOGRAPHIC ANATOMY, Doctor Meschan has set out to present the fundamentals of radiology rearranged on a basis of objective signs as seen in roentgenograms. The limitations and accuracy in roentgen diagnoses are considered along with the responsible anatomic and technical factors. The work is intended as a teaching guide, and is organized to give the student the viewpoint of integrating the known clinical data with the aberration from the normal in the roentgenogram in order to arrive at an impression or differential diagnosis. Doctor Meschan's approach is organized in keeping with modern radiologic teaching in which roentgen findings and signs are considered only in conjunction with radiographic pathology and clinical data. The text is divided into 31 chapters and deals with radiographic equipment and the physical foundations, protection, the radiologist and his functions, thence onto the skeletal system, the chest and its contents, abdomen, urinary tract, gall bladder, gastro-intestinal tract, obstetrics and gynecology. The author discusses the normal anatomy of the area under consideration, the technical aspects of the appropriate roentgen studies and the radiographic pathology. General pathology and physiology including biochemical findings are often discussed. In several chapters general medicine and radiologic data are assembled and used in the form of differential diagnostic possibilities in arriving at a correct diagnosis.

The text is readable. Since it was not the object of the author to produce a reference book, descriptions are often brief. The illustrations and reproductions are numerous and excellent line drawings are to be found elucidating characteristic findings. The author has included a bibliography with references to significant articles.

The volume is recommended for radiology residents, serious students of radiology and those engaged in the teaching of this subject.

H. P. LESSELBAUM, M.D.

PHYSIOLOGY

Those vain trifling chemists were certainly in the wrong, who have pretended by their art alone to explain physiology in all its parts; nor, however, are those less mistaken, who imagine they can do this without chemistry. Let anatomy faithfully describe the parts and structure of the body; let the mechanician apply his particular science to the solids; let hydrostatics explain the laws of fluids in general, and hydraulics their actions, as they move through given canals; and, lastly, let the chemist add to all these, whatever his art, when fairly and carefully applied, has been able to discover; and then, if I am not mistaken, we shall have a complete account of medical physiology.

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Seborrheic Dermatitis

In a report on 26 cases of seborrheic dermatitis, Niedelman and Bleier[1] used wet dressings as part of the therapy.

In the cases they observed "the dermatosis involved not only the scalp, but usually the intertriginous areas with secondary infection." They state that "cool compresses gave relief from the pruritus, infection, and exudation. As soon as the areas became dry other preparations were instituted."

BURO-SOL® ANTISEPTIC POWDER "DOAK" is the ideal product to use in preparing wet dressings. When dissolved in water it combines the astringent and soothing benefits of Burow's Solution with the antiseptic and deodorizing properties of Benzethonium Chloride N.N.R.

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BURO-SOL ANTISEPTIC POWDER "DOAK" is available through all pharmacies.

[1]Niedelman, M. L. and Bleier, A.:
Med. Times 83:238-248 (March) 1955.

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P.S.: For an effective soak —
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RECENT ADVANCES IN THE UNDERSTANDING AND MANAGEMENT OF CEREBRAL VASCULAR DISEASE

concluded from page 584

Basilar and Carotid Arteries in Man, Neurology 6:455, 1956.

[21]Meyer, J. S.; Kane, C. A.; Reinmuth, O. L.; and Wegner, W.: Electroencephalographic Evaluation of Treatment in Obstructive Disease of the Basilar and Carotid Arteries. In press. 1957

[22]Millikan, C. H.; Siekert, R. G.; and Shick, R. M.: Studies in Cerebrovascular Disease. V. The Use of Anticoagulant Drugs in the Treatment of Intermittent Insufficiency of the Internal Carotid Arterial System, Proc. Staff Meet. (Mayo Clinic) 30:578, 1955

[23]Wright, I. S.; and McDevitt, E.: Cerebral Vascular Diseases. Their Significance, Diagnosis, and Present Treatment, Including the Selective Use of Anticoagulant Substances. Ann. Int. Med. 41:682, 1954

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[25]Wright, I. S.; and Luckey, E. H.: Cerebral Vascular Diseases, Transactions of Conference, Princeton, N. J. (Jan. 1954), Grune and Stratton, 1955, 167 pages

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INTERIM MEETING . . .

3:00 P.M. on November 13

INVESTIGATIONS OF OBSTETRICAL FACTORS IN SUBSEQUENT NEUROPSYCHIATRIC DISORDERS IN CHILDREN

concluded from page 564

[27]Romney, S. L.; Reid, D. E.; Melcalfe, J.; Burwell, C. S.: Oxygen Utilization by the Human Fetus in Utero. Am. J. Obst. & Gynec. 70: 791, 1955

[28]Schwartz, P.: Die Traumatischen Schadigungen des Zentral-Nerven Systems Durch Die Geburt. Ztsch. f. Ges. Neurol. & Psychiat. 90: 263, 1924

[29]Walker, J.; Turnbull, E. P. N.: Hemoglobin and Red Cells in the Human Fetus. Lancet. 2: 312, 1953

THE OPHTHALMOSCOPE

I was endeavouring to explain to my pupils the emission of reflected light from the eye, a discovery made by Bruecke, who would have invented the ophthalmoscope had he only asked himself how an optical image is formed by the light returning from the eye. In his research it was not necessary to ask it but had he asked it, he was just the man to answer it quickly as I did and to invent the instrument. I turned the problem over and over to ascertain the simplest way in which I could demonstrate the phenomenon to my students. It was also a reminiscence of my days of medical study that ophthalmologists had great trouble in dealing with certain cases of eye disease, then known as black cataract. The first model was constructed of pasteboard, eye lenses, and cover glasses used in the microscopic work. It was at first so difficult to use that I doubt if I should have persevered unless I had felt that it must succeed; but in eight days I had the great joy of being the first who saw before him the human living retina.

HERMANN VON HELMHOLTZ (1821-1894)

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Meat fits well into the moderate-protein, restricted-sodium, acid-ash diet currently recommended for many patients with congestive cardiac failure.[1]

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In addition to these important features, meat contributes other nutritional factors essential in any convalescence —the B vitamins thiamine, riboflavin, niacin, pantothenic acid, B_6, and B_{12}, and the minerals iron, phosphorus, potassium, and magnesium.

1. Odell, W. M.: Nutrition in Cardiovascular Disease, in Wohl, M. C., and Goodhart, R. S.: Modern Nutrition in Health and Disease, Philadelphia, Lea & Febiger, 1955, p. 699.
2. Bills, C. E.; McDonald, F. G.; Niedermeier, W., and Schwartz, M. C.: Sodium and Potassium in Foods and Waters, J. Am. Dietet. A. *25*:304 (Apr.) 1949.

The nutritional statements made in this advertisement have been reviewed by the Council on Foods and Nutrition of the American Medical Association and found consistent with current authoritative medical opinion.

American Meat Institute
Main Office, Chicago... Members Throughout the United States

PRINCIPLES OF MEDICAL ETHICS

As Adopted by the American Medical Association

PREAMBLE. These principles are intended to aid physicians individually and collectively in maintaining a high level of ethical conduct. They are not laws, but standards by which a physician may determine the propriety of his conduct in his relationship with patients, with colleagues, with members of allied professions and with the public.

* * *

Section 1. The principal objective of the medical profession is to render service to humanity with full respect for the dignity of man. Physicians should merit the confidence of patients entrusted to their care, rendering to each a full measure of service and devotion.

Section 2. Physicians should strive continually to improve medical knowledge and skill, and should make available to their patients and colleagues the benefits of their professional attainments.

Section 3. A physician should practice a method of healing founded on a scientific basis; and he should not voluntarily associate professionally with anyone who violates this principle.

Section 4. The medical profession should safeguard the public and itself against physicians deficient in moral character or professional competence. Physicians should observe all laws, uphold the dignity and honor of the profession and accept its self-imposed disciplines. They should expose, without hesitation, illegal or unethical conduct of fellow members of the profession.

Section 5. A physician may choose whom he will serve. In an emergency, however, he should render service to the best of his ability. Having undertaken the care of a patient, he may not neglect him; and unless he has been discharged he may discontinue his services only after giving adequate notice. He should not solicit patients.

Section 6. A physician should not dispose of his services under terms or conditions which tend to interfere with or impair the free and complete exercise of his medical judgment and skill, or tend to cause a deterioration of the quality of medical care.

Section 7. In the practice of medicine a physician should limit the source of his professional income to medical services actually rendered by him, or under his supervision, to his patients. His fee should be commensurate with the services rendered and the patient's ability to pay. He should neither pay nor receive a commission for referral of patients. Drugs, remedies or appliances may be dispensed or supplied by the physician provided it is in the best interests of the patient.

Section 8. A physician should seek consultation upon request; in doubtful or difficult cases; or whenever it appears that the quality of medical service may be enhanced thereby.

Section 9. A physician may not reveal the confidences entrusted to him in the course of medical attendance, or the deficiencies he may observe in the character of patients, unless he is required to do so by law or unless it becomes necessary in order to protect the welfare of the individual or of the community.

Section 10. The honored ideals of the medical profession imply that the responsibilities of the physician extend not only to the individual but also to society where these responsibilities deserve his interest and participation in activities which have the purpose of improving both the health and well being of the individual and the community.

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BOOK REVIEWS

A MANUAL OF PHARMACOLOGY and Its Applications to Therapeutics and Toxicology by Torald Sollmann, M.D. W. B. Saunders Co., Phil., 1957. 8th ed. $20.00

Within this 1,535-page reference text, both general and specific information about standard, proprietary, and experimental drugs is found. The first 60 pages are devoted to a review of basic pharmacologic principles, objectives of treatment, drug incompatibilities, general toxicology, and the essential constituents of foods. The remainder of the book deals with an orderly presentation of allied drugs together with a résumé of their history, development, distribution in nature, chemical structure, standardization, and metabolic fate.

Each topic is discussed adequately but in no way exhaustively. For those who desire more detailed information, ample references are listed in the 155-page appendix-bibliography.

A simplified index greatly facilitates the selection of all major topics which are not only skillfully subdivided, but also graphically depicted in bold print. Italicized words and key phrases further assist in the visual selection of essential facts and in the eventual retention of basic knowledge.

Since this edition of A MANUAL OF PHARMACOLOGY contains most of the important pharmacologic and therapeutic additions to the literature from 1940 to 1956, it should grace the reference shelves of all complete libraries.

ALBERT F. TETREAULT, M.D.

PSYCHOSOMATIC MEDICINE. A Clinical Study of Psychophysiologic Reactions by Edward Weiss, M.D. and O. Spurgeon English, M.D. W. B. Saunders Co., Phil., 1957. 3rd ed. $10.50

This third edition contains much new clinical material. The motto of this book is Plato's quotation: "For this is the great error of our day . . . that the physicians separate the soul from the body." Although widely accepted in medical education today, this concept is not yet thoroughly integrated. It has been found that, roughly one third of patients in general practice have *no definite physical illness*. Another third have symptoms *in part* dependent on emotional factors, even though organic factors are present. The third group includes the so-called *psychophysiologic stress* symptoms. A physician should be trained so as to know how to manage the many emotional problems seen in daily practice.

From another point of view, PSYCHOSOMATIC MEDICINE presents an extension of our knowledge of neuroses and psychoses in the psychopathology of conditions previously thought to be in the realm of purely physical medicine. For instance, information that 10% of patients with cancer of the pancreas suffer from depression, anxiety and insomnia may be helpful to the psychiatrist as well as to the medical man. The study of effects of anxiety upon the normal heart, diseased heart and hypertension should be useful to the internist. The importance of psychiatric consultation prior to heart surgery (because of "premorbid" personality of the patient) is stressed.

The authors feel that no work on psychosomatics could have been attempted without the biologically oriented psychology of Freud in its fundamental application to this new synthesis in medicine. Following his discovery Ferenczi, Abraham, Jones, Jelliffe, Felix Deutsch, Wittkower, Menninger, Alexander, Flanders Dunbar and their associates have added much to our knowledge in this field. The future books in medicine will have to embody this approach.

Part One of this book deals with the general aspects of psychosomatic medicine. It describes minor and major psychotherapy. Part Two deals with special applications to general medicine and the specialties. Beside chapters on Cardiovascular System, Gastrointestinal System, Respiratory System, Skin Disorders and Allergies, there are others on Surgery, Arthritis, Genitourinary System, Pediatrics, Orthopedics, Disorders of the Ear and Eye, etc. Numerous illustrations by individual case histories make for fascinating and easy reading.

The authors recommend that busy practitioners and specialists read the first two chapters to get a general idea and then the chapters which are of particular interest to them. This book gives one practical advice: "If we listened as carefully to what the patients say, as to the noises produced by their organs, we might learn a great deal more about their illnesses."

CATHERINE ZOURABOFF, M.D.

concluded on page 660

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